CPC TOTAL RACK CONTROL

Model Number: TRC

Part Number: 820-1000

INSTALLATION, OPERATING, AND TROUBLESHOOTING INSTRUCTIONS

Document No. 025-8100

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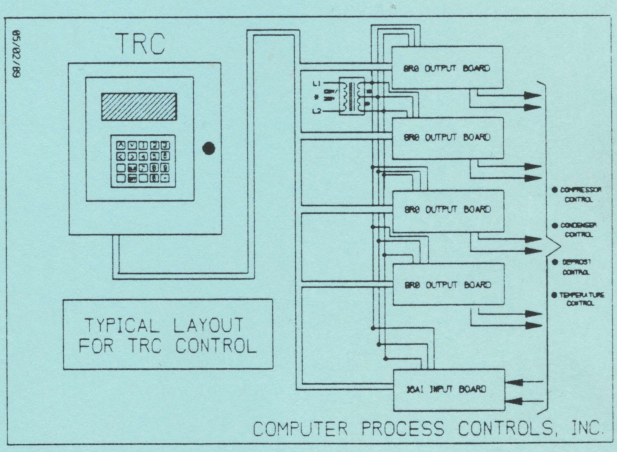
Version AFJA

Computer Process Controls, Inc.
1275 Kennestone Circle
Suite 100
Marietta, Ga. 30066

(404) 425-2724



TRC

TRC USERS MANUAL

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SECTION I

GENERAL INFORMATION

1.1 INTRODUCTION. This manual contains information necessary to install, operate, and maintain the Computer Process Controls Inc. model TRC Total Rack Control (Part No. 820-1000). Each TRC will control up to seventeen boards consisting of a combination of up to 16 8RO Output Boards (128 outputs), up to 7 16AI Input Boards (112 inputs), and one VS Variable Speed Controller Board.

1.2 GENERAL DESCRIPTION. The TRC is a stand alone microprocessor based control system used in conjunction with CPC input and output cards for the control and monitoring of parallel and multi-stage refrigeration compressor racks of all types. The TRC system may be field or factory mounted. It is a simple-to-operate control which has combined the important functions of the compressor rack: suction pressure, oil pressure, discharge pressure, defrost, temperature, and condenser fan operation.

A 40 column by 8 line backlit LCD display provides an easy to read graphic display of the information. An alpha-numeric keypad with directional arrows provides easy access for monitoring and entering set points. Remote communication is standard.

FEATURES:

Suction Pressure Control of 15 Compressors (two suction groups:10 and 3; plus two singles).
Controls Variable Speed Compressor.
Head Pressure Control (eight fans).
Equalized Run times for Compressors and Fans
Temperature Control (32 circuits).
Defrost Control (23 circuits, gas, electric, or off cycle).
Oil Pressure Monitoring and Cut-Out.
Satellite Compressor Control for two compressors.
Refrigerant Level Monitoring.
Power Monitoring.
"Proof" inputs for compressors and condenser fans.
Logging and graphing of system inputs.
Remote Communications

The operator of the TRC has valuable information about the total refrigeration system's present and past performance at his fingertips.

1.3 THEORY OF OPERATION. The Total Rack Control through one or more input boards (16AI) continuously monitors the values and parameters for refrigerant pressures, condenser operation, defrost operation, and temperature control. As it monitors these values and compares them against setpoints it maintains the compressors, fans, defrost, and temperature within the overall preset parameters. Interface with the actual devices being controlled is accomplished through one or more (8RO) output boards.

Using the CPC VS (Variable Speed) board, the TRC varies the speed of a conventional refrigeration compressor through a power inverter to maintain capacity and operating efficiency within the operator's preset operating parameters.

Operational logic for suction pressure, discharge pressure, and general compressor operation is enhanced by these features:

Two suction groups (10 compressors plus 3 compressors).
Two single compressor satellites.
One Variable Speed compressor.
Evens or unevens with equalized run times(where two or more are equal).

Proportional-Integral-Derivative Control:
Allows multiple unloaders
No unloaders on without compressor on.
Matches compressor or unloader requirements with load.
Uses Horsepower or BTUH, and with a single setpoint, it determines the necessary capacity based on the average difference of the actual suction pressure and this set point.
Eliminates illegal steps and provides staggered starting with built in delays.

Oil Pressure monitoring and shut-down.

Plus much more.

The logic for head pressure (condenser fan) control is similar to that of the CPC Intelligent Condenser Control (ICC) with:

Up to eight fans on control.
Deadband operation.
Decreasing time delay strategy.
Equalized run time (program selectable).

Likewise, the TRC controls defrost using similar logic as is used in the CPC Intelligent Defrost Control (IDC) with:

Simplified programming.
23 circuits.
6 defrost/day.
Run-off period.
Manual operation.
Hot gas, electric, or off cycle.

Temperature control of up to:
32 circuits.
Using cut-in and cut-out setpoints.
High/low alarms.

This manual will introduce you to all of the features and functions of the TRC and help you to make use of them.

1.4 WIRING. All wiring to the TRC (power and communication loop) is connected to removable terminal blocks for ease of installation. All sensor input and control output wires are connected to the removable terminal blocks supplied on the input and output boards. See Section III for wiring details.

1.5 OPTIONAL EQUIPMENT. The TRC may be enhanced with the following optional equipment available from CPC::

a. Temperature sensors.
b. Pressure transducers.
c. Refrigerant level sensor for horizontal receivers.
d. Humidity switch.
e. Humidity sensor.
f. Dewpoint sensor.
g. Watt-Hour transducer.
h. 16AI input cards (16 points each) (maximum of 5).
i. 8RO output board (8 points each) (maximum of 9).
j. Variable Speed Controller board (maximum of 1).
k. Transformers for powering the boards.
l. Telephone modem to permit use of the remote communication feature.

Contact CPC for additional information on TRC options.

1.6 TECHNICAL CHARACTERISTICS. Technical Characteristics of the TRC are shown in the following table:

TABLE 1-1

TECHNICAL CHARACTERISTICS

Components	Characteristics
TRC Panel Display	40 column x 8 line back lit LCD. display Displays status, configuration,logs, graphs, alarms, prompts, etc.
Power Input TRC SYSTEM	TRC Controller: 120VAC/208VAC Selectable, 48 watts maximum. 16AI, 8RO, VS: 20VAC(10v/10v) 16AI - 0.25 amp., 5.0 VA. 8RO - 0.75 amp., 15.0 VA. VS - 0.50 amp., 10.0 VA. Alarm-485 Option: 120VAC

TABLE 1-1 (Continued)

TECHNICAL CHARACTERISTICS

Components	Characteristics
TRC Keypad	Full alpha/numeric keypad with directional arrows.
TRC Communications	Two RS485 (COM A & COM B) Two RS232 (COM C & COM D).
Dimensions	TRC Controller 10" Wide x 12 1/4" High x 4 1/8" Deep. Weight: Approx. 7.0 lbs. 8R0 Output Board: 10" Wide x 4" High x 1 7/8" Deep. Weight: Approx. 1.0 lbs. 16AI Input Board: 10" Wide x 4" High x 2 1/4" Deep. Weight: Approx. 1.0 lbs. VS Variable Speed Board 10" Wide x 5" High x 1 7/8" Deep. Weight: Approx. 1.5 lbs.
Field Outputs	8RO Output Board: Relay Dry Contacts, jumper for selection of N.O./N.C. outputs, L.E.D. indicates state, 24v-240v, max. 2 amps., max. 1992 VA/Board, 8 outputs/board.
Field Inputs	16AI Input Board: Analog (-1 to +7VDC) Or Digital (Dry Contacts), field selectable, 16 inputs/board.
Operating Environment	Temperature: -20^{O} to 120^{O}F. Humidity: 0-95% non-condensing.
Battery Backup	Minimum 24 hours, replaceable battery with 10 year life.

INSTALLATION

SECTION II

2.1 GENERAL. This section contains suggestions and factors to consider during the installation phase of the TRC. Follow these suggestions to assure satisfactory performance from the equipment. In general the procedure includes:

a. Mounting the main controller.
b. Mounting the 16AI input board(s), 8RO output board(s), VS variable speed board, and transformers.
c. Mounting temperature sensors, pressure transducers, and other accessories.

2.2 MOUNTING THE TRC CONTROLLER.

DISCONNECT POWER SUPPLY TO THE RACK BEFORE BEGINNING. ONLY TRAINED SERVICE PERSONNEL SHOULD INSTALL THIS UNIT.

The TRC has been designed to mount directly on the refrigeration rack unit. It may also be mounted on an adjacent wall, if desired.

Mounting holes are provided on the TRC enclosure back, Refer to Fig. 2-1 for mounting hole dimensions. DO NOT DRILL ANY HOLES IN THE ENCLOSURE.

The mounting method used must provide adequate isolation from extreme vibration and moisture. Locate the controller where wiring to the input/output boards, the control circuits and supply voltage is most convenient.

All mounting must be done in accordance with local and national electrical codes.

2.3 MOUNTING ACCESSORY BOARDS. The 16AI Input Board, 8RO Output Board, and VS Variable Speed Board should be mounted in a dry enclosure convenient to the input sensors, output control circuits, etc. Mounting in the compressor rack control panel is preferred. As an alternate these boards may be mounted in an electrically approved enclosure on a wall convenient to the devices to be controlled. Refer to Fig. 2-2 and Fig. 2-3 for the mounting dimensions. Use six #6-32 x 3/4 Self tapping machine screws for each board. Mount all boards so that the imprinted labels are upright. This will assure that the relays on the 8RO boards are properly oriented.

2.4 INSTALLING THE PRESSURE TRANSDUCERS. Most applications will require one suction pressure transducer for each suction group and for each single compressor. One or more discharge pressures transducers will be required, depending upon the condenser circuits. If oil pressure is to be monitored, one oil pressure transducer will be required for each oil pump. The oil pressure differential is the difference between the oil pump and the suction pressure; therefore the oil pressure transducer should be mounted so as to sense the crankcase pressure. The suction transducer part number is 800-0101 (0 - 100 psig) and the discharge and oil transducer is part number 800-0501 (0 - 500 psig).

EACH TRANSDUCER MUST BE MOUNTED IN A VERTICAL POSITION SO AS TO ALLOW NATURAL PROTECTION FROM POSSIBLE OIL DAMAGE. IN ADDITION, IT MUST BE MOUNTED ABOVE CRANK CASE OIL LEVEL. DO NOT MOUNT WHERE OIL WILL RUN DOWN INTO THE TRANSDUCER PORT.

CAUTION: DO NOT PRESSURE TEST SYSTEM WITH TRANSDUCERS INSTALLED.

Both low pressure and high pressure transducers will thread into a 1/8" female pipe thread fitting. Use adequate pipe thread compound to insure proper sealed fit. CPC recommends the use of a shut-off valve between the transducer and the pressure pipe fitting so as to make transducer isolation and replacement convenient.

Please refer to Figures 2-4 and 2-5 for transducer mounting details.

2.5 INSTALLING THE TEMPERATURE SENSORS. The temperature sensor is an extremely accurate measuring device and therefore enhances the TRC's ability to provide the ultimate in operating efficiency for the entire system. Care should be used in locating the sensor within the refrigerated fixture. The temperature sensor is used in a variety of ways to control the overall refrigeration system. All of these are applications are optional and should be selected to provide optimum operating strategies. A few of the possibilities are as follows:

a. Case temperature monitoring (control, alarms. etc.)
b. Floating sensor (floating suction pressure setpoint)
c. Satellite sensor (may be used in lieu of suction pressure)
d. Defrost termination (terminates defrost heated cycle)
e. Air temperature (condenser applications)
f. Refrigerant temperature (condenser applications and monitoring)

As a general rule the location of the sensor in the refrigerated display case should be located in the air leaving the evaporator coil just before it enters into the food compartment. Check with your case manufacturer for their specific suggestions. They know their cases better than anyone else. The same sensor may, in most cases, be used for a multiple purpose. For example: the same sensor could terminate defrost; provide the temperature for floating the suction pressure, and cut in and cut out set points. The temperature sensor used for floating the suction setpoint should be located in the coldest refrigerator on the circuit.

Refer to Figures 2-5 through 2-8 for locating the temperature sensor in the fixture's discharge air stream.

Each temperature sensor is CPC Part No. 501-1121.

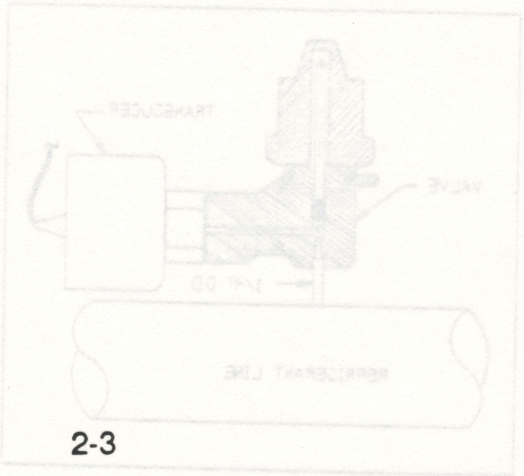
Caution:

Make sure that the sensor is accessible so that verification and or replacement can be made without disassembling the fixture.

Where the temperature sensor is to directly control either suction pressure or case temperature, any EPR valves, etc., should be either removed, adjusted to a lower pressure setting or manually opened.

Sensors located on refrigerant tubing should be placed within a thermal well or insulated so as to avoid the influence of the surrounding air.

DO NOT RUN SENSOR WIRE WITH LINE VOLTAGE WIRING. Sensors should be wired using shielded cable or placed in conduit with no other wiring. If shielded, connect the shield at the 16AI board common terminal only. Do not ground at sensor location.



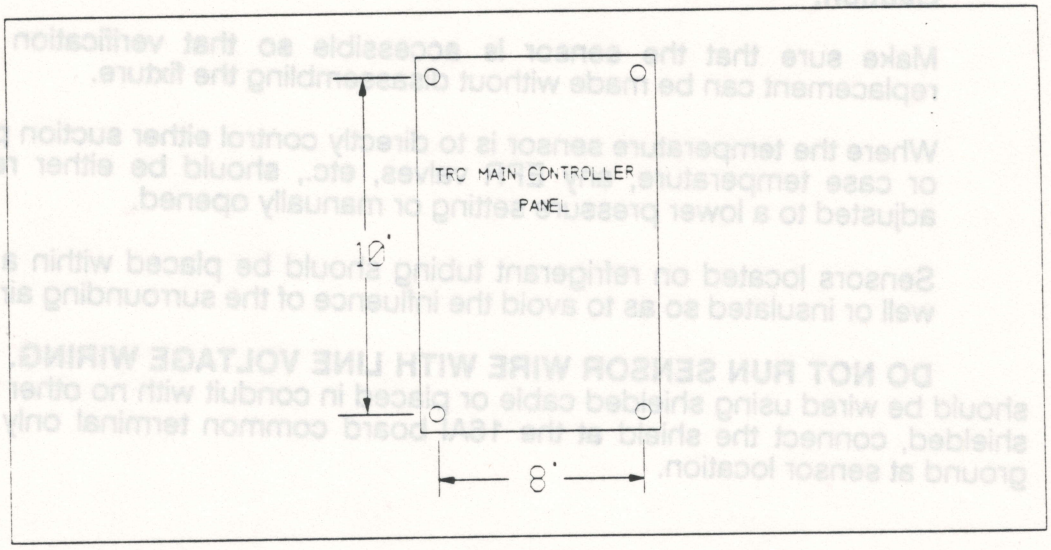


FIG. 2-1
TRC MOUNTING DIMENSIONS

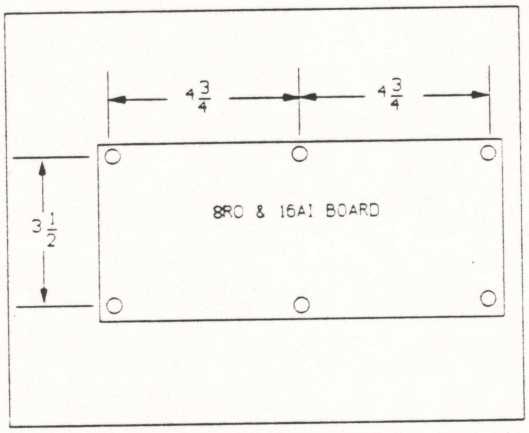


FIG. 2-2
8RO & 16AI MOUNTING DIMENSIONS

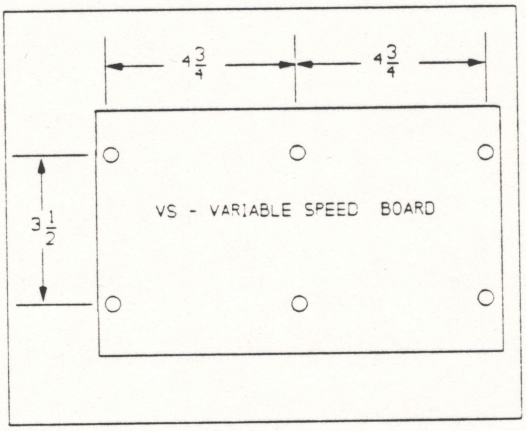


FIG. 2-3
VS MOUNTING DIMENSIONS

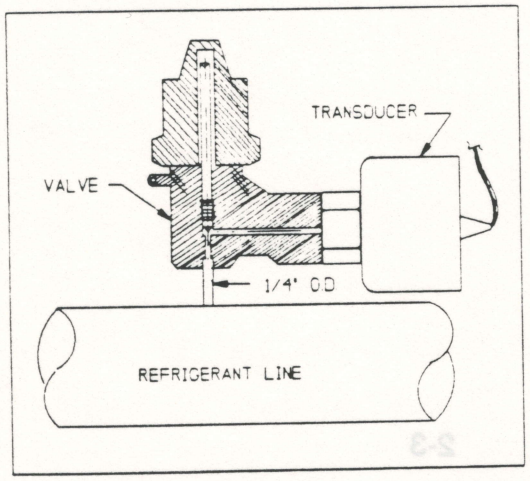


FIG. 2-4
TRANSDUCER MOUNTING WITH VALVE

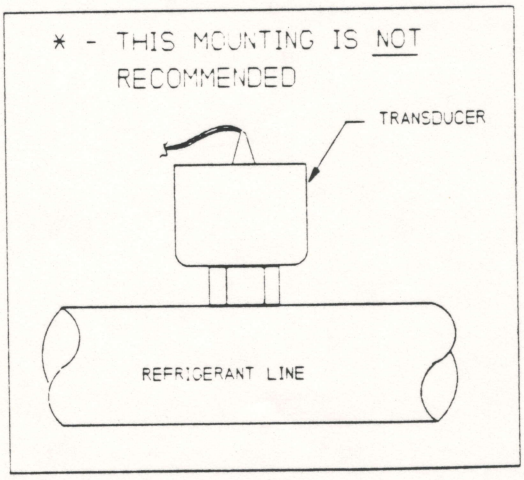
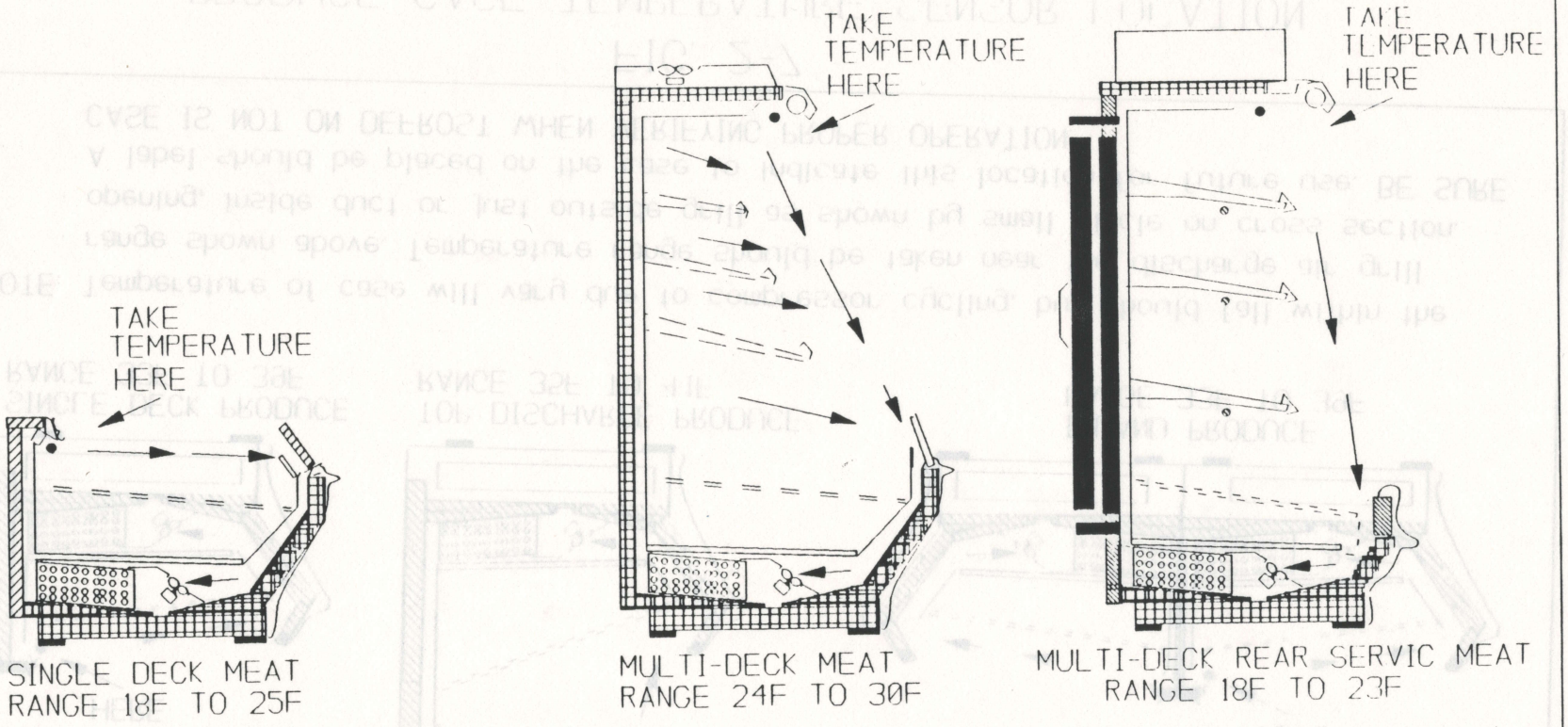


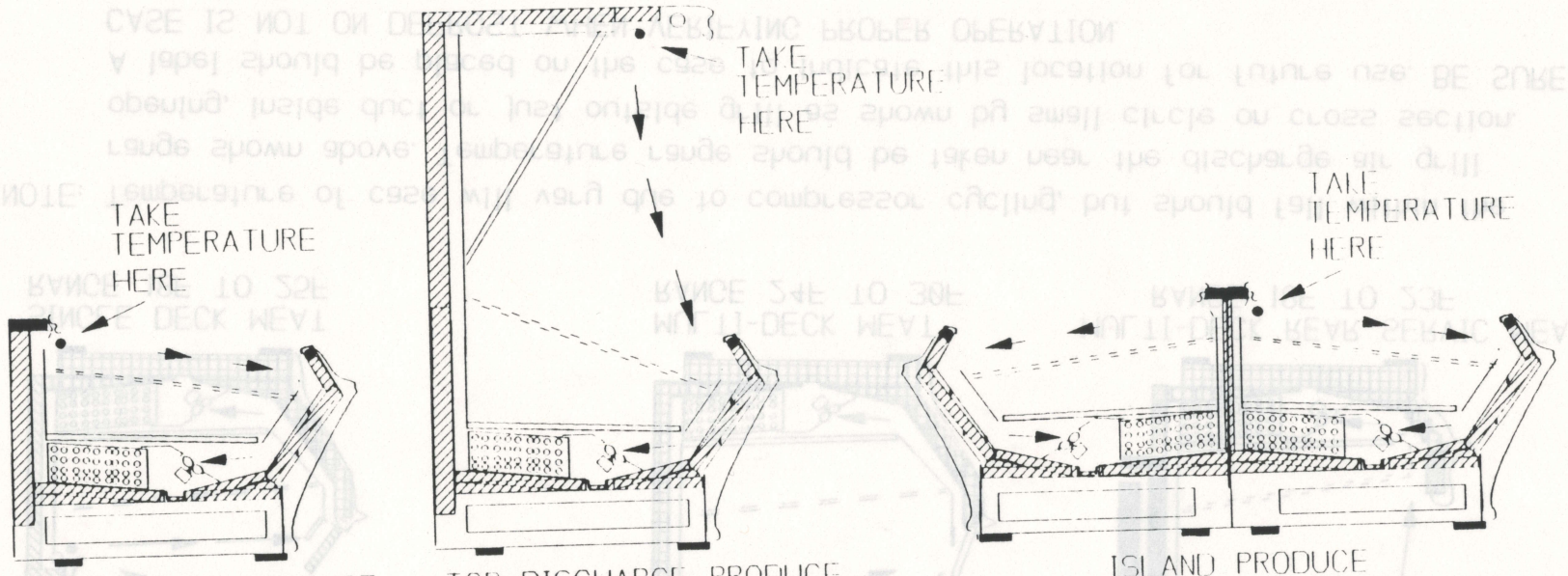
FIG. 2-5
TRANSDUCER MOUNTING WITHOUT VALVE


TAKE TEMPERATURE HERE
SINGLE DECK MEAT RANGE 18F TO 25F
TAKE TEMPERATURE HERE
MULTI-DECK MEAT RANGE 24F TO 30F
TAKE TEMPERATURE HERE
MULTI-DECK REAR SERVIC MEAT RANGE 18F TO 23F

NOTE: Temperature of case will vary due to compressor cycling, but should fall within the range shown above. Temperature range should be taken near the discharge air grill opening, inside duct or just outside grill as shown by small circle on cross section. A label should be placed on the case to indicate this location for future use. BE SURE CASE IS NOT ON DEFROST WHEN VERIFYING PROPER OPERATION.

FIG. 2-6

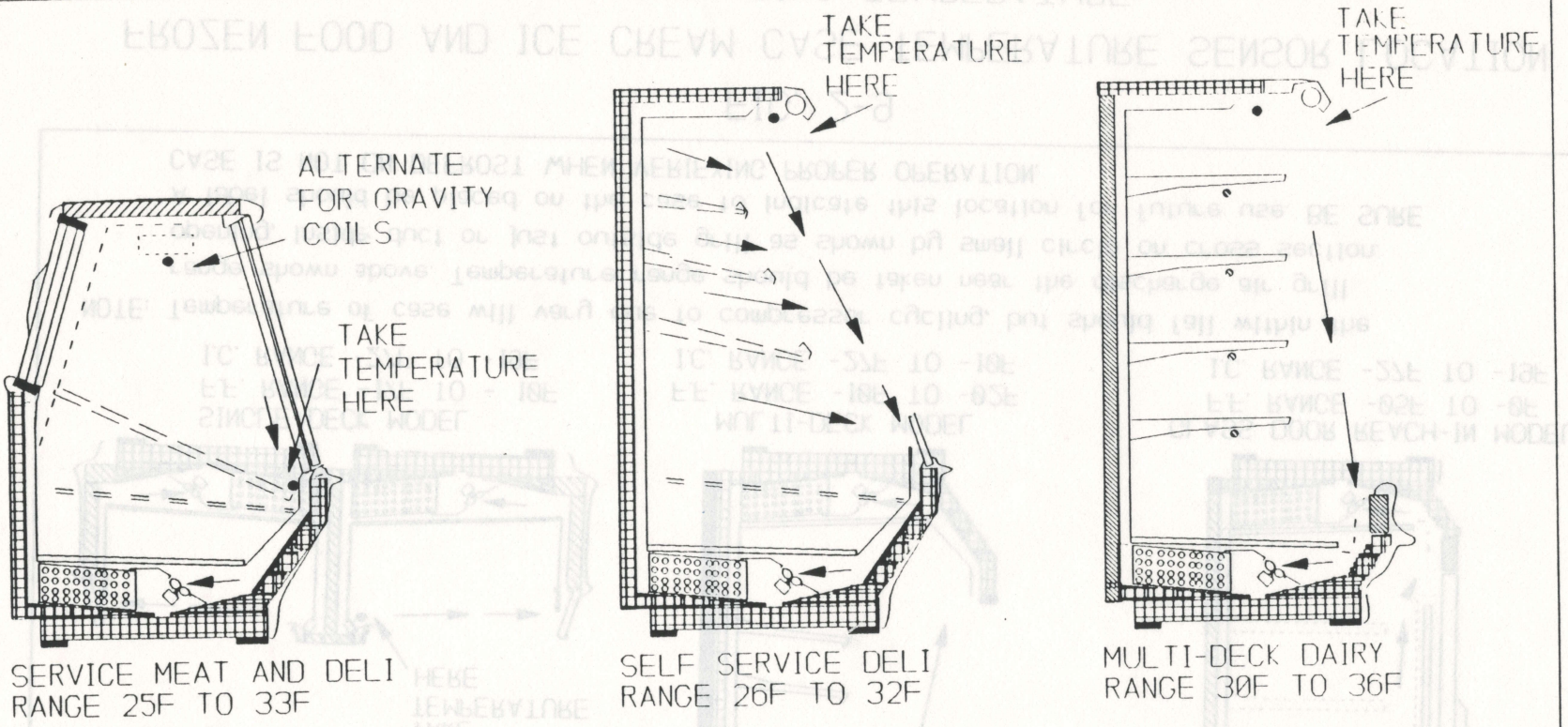
MEAT CASE TEMPERATURE SENSOR LOCATION AND OPERATING TEMPERATURE



NOTE: Temperature of case will vary due to compressor cycling, but should fall within the range shown above. Temperature range should be taken near the discharge air grill opening, inside duct or just outside grill as shown by small circle on cross section. A label should be placed on the case to indicate this location for future use. BE SURE CASE IS NOT ON DEFROST WHEN VERIFYING PROPER OPERATION.

FIG. 2-7

PRODUCE CASE TEMPERATURE SENSOR LOCATION
AND OPERATING TEMPERATURE

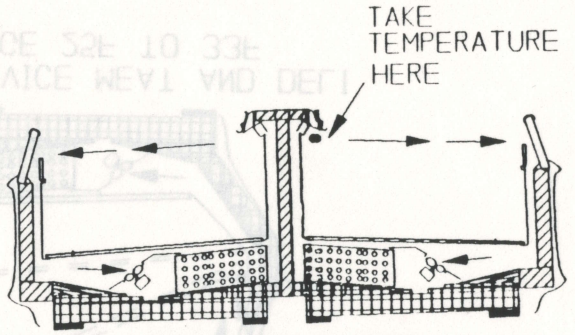


NOTE: Temperature of case will vary due to compressor cycling, but should fall within the range shown above. Temperature range should be taken near the discharge air grill opening, inside duct or just outside grill as shown by small circle on cross section. A label should be placed on the case to indicate this location for future use. BE SURE CASE IS NOT ON DEFROST WHEN VERIFYING PROPER OPERATION.

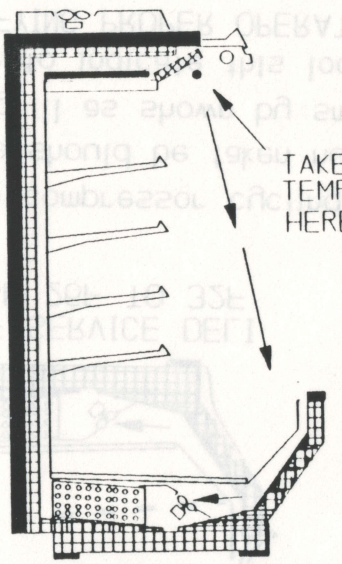
FIG. 2-8

DELI AND DAIRY CASE TEMPERATURE SENSOR LOCATION AND OPERATING TEMPERATURE

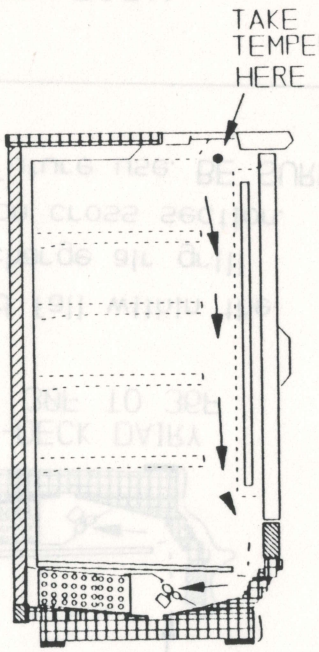
05-09-89



SINGLE DECK MODEL
F.F. RANGE -17F TO - 10F
I.C. RANGE -27F TO -19F



MULTI-DECK MODEL
F.F. RANGE -10F TO -02F
I.C. RANGE -27F TO -10F



GLASS DOOR REACH-IN MODEL
F.F. RANGE -05F TO -0F
I.C. RANGE -27F TO -19F

NOTE: Temperature of case will vary due to compressor cycling, but should fall within the range shown above. Temperature range should be taken near the discharge air grill opening, inside duct or just outside grill as shown by small circle on cross section. A label should be placed on the case to indicate this location for future use. BE SURE CASE IS NOT ON DEFROST WHEN VERIFYING PROPER OPERATION.

FIG. 2-9

FROZEN FOOD AND ICE CREAM CASE TEMPERATURE SENSOR LOCATION AND OPERATING TEMPERATURE

SECTION III

FIELD WIRING

3.1 WIRING PROCEDURES. Table 3-1 gives recommended wire gauge and type for wiring to each of the terminals in the TRC, VS Board, and the Input/Output boards. For other than the shielded wire, for best results use, only stranded type TFF wire #18 gauge or smaller as the electrical code permits.

TABLE 3-1

TERMINAL DESIGNATION AND RECOMMENDED WIRE

Term.Block	Term.#	Function		Wire	
TRC					
TB1	1	(+)	(8RO,	RED	22GA 2COND.
(RS485	2	0V	16AI,	SHIELD	BELDEN NO.
COM. A)	3	(-)	VS)	BLACK	8761*
TB2	4	(+)		RED	22GA 2COND.
(Future)	5	0V		SHIELD	BELDEN NO.
+(RS485	6	(-)		BLACK	8761*
COM B.)					
TB3	7	0V		SHIELD	22GA 3COND.
(RS232	8	TXC+Modem		RED	BELDEN NO.
COM. C)	9	RXC+		BLACK	8771
	10	DTR		WHITE	
TB4	11	0V		SHIELD	22GA 2COND.
(Future)	12	TXD+		RED	BELDEN NO.
(RS232	13	RXD+		BLACK	8761*
COM. D)					
TB5	14	AC1 10V		RED	22GA 2COND.
(POWER OUT)	15	C.T.0V 1 amp.		SHIELD	BELDEN NO.
	16	AC2 10V		BLACK	8761*
TB6	17	GROUND			18GA TFF
POWER IN	18	(NEUT.)			600V
	19	HOT			CHECK CODE
16AI					
TB1	1	AC1 10V		RED	22GA 3COND.
POWER IN	2	C.T.0V .25 AMP		SHIELD	BELDEN NO.
	3	AC2 10V		BLACK	8761*

* If over 2000 feet use 16 gauge 2 conductor with shield, Belden No. 8719 or equal.

TABLE 3-1 (CONTINUED)

TERMINAL DESIGNATION AND RECOMMENDED WIRE

Term.Block	Term.#	Function	Wire	
16AI Cont'd.				
TB2 RS485	4	+	RED	22GA 2COND.
	5	0V	SHIELD	BELDEN NO.
	6	-	BLACK	8761*
TB3 ANALOG OR DIGITAL	1	(COM.)	SHIELD & COMMON	
	2	+ SIGNAL	WHITE, NOTE: (1)	
	3	(COM.)	SHIELD & COMMON	
	4	+ SIGNAL	WHITE, NOTE: (1)	
	5	(COM.)	SHIELD & COMMON	
	6	+ SIGNAL	WHITE, NOTE: (1)	
	7	(COM.)	SHIELD & COMMON	
	8	+ SIGNAL	WHITE, NOTE: (1)	
TB4 ANALOG OR DIGITAL	9	(COM.)	SHIELD & COMMON	
	10	+ SIGNAL	WHITE, NOTE: (1)	
	11	(COM.)	SHIELD & COMMON	
	12	+ SIGNAL	WHITE, NOTE: (1)	
	13	(COM.)	SHIELD & COMMON	
	14	+ SIGNAL	WHITE, NOTE: (1)	
	15	(COM.)	SHIELD & COMMON	
	16	+ SIGNAL	WHITE, NOTE: (1)	
TB5 ANALOG OR DIGITAL	17	(COM.)	SHIELD & COMMON	
	18	+ SIGNAL	WHITE, NOTE: (1)	
	19	(COM.)	SHIELD & COMMON	
	20	+ SIGNAL	WHITE, NOTE: (1)	
	21	(COM.)	SHIELD & COMMON	
	22	+ SIGNAL	WHITE, NOTE: (1)	
	23	(COM.)	SHIELD & COMMON	
	24	+ SIGNAL	WHITE, NOTE: (1)	

* If over 2000 feet use 16 gauge 2 conductor with shield, Belden No. 8719 or equal.

NOTE 1: Use 2 or 3 conductor shielded cable depending on analog device. Belden #8761(2); #8771(3) or equal.

TABLE 3-1 (CONTINUED)

TERMINAL DESIGNATION AND RECOMMENDED WIRE

Term.Block	Term.#	Function	Wire	
16AI Cont'd.				
	25	(COM.)	SHIELD & COMMON	
	26	+ SIGNAL	WHITE, NOTE: (1)	
	27	(COM.)	SHIELD & COMMON	
TB6	28	+ SIGNAL	WHITE, NOTE: (1)	
ANALOG	29	(COM.)	SHIELD & COMMON	
OR	30	+ SIGNAL	WHITE, NOTE: (1)	
DIGITAL	31	ANALOG (COM.)	SHIELD & COMMON	
	32	+ SIGNAL	WHITE, NOTE: (1)	
	5V		NOT USED	
	5V	+5 VOLT	NOT USED	
	5V	D.C.	NOT USED	
	5V		NOT USED	
TB7				
	12V		RED, NOTE: (1)	
	12V	+12 VOLT	RED, NOTE: (1)	
	12V	D.C.	RED, NOTE: (1)	
	12V		RED, NOTE: (1)	
8R0				
TB1	1	AC1 10V	RED	22GA. 3COND.
POWER IN	2	C.T.0V.75 AMP	SHIELD	BELDEN NO.
	3	AC2 10V	BLACK	8761*
	4	(+)	RED	20GA. 2COND.
TB2	5	0V	SHIELD	BELDEN NO.
RS485	6	(-)	BLACK	9154*
TB3	7	LINE	18 GA. TFF 600V	
SWITCH OUTPUT	8	#1 LOAD	CHECK CODE	
TB4	9	LINE	18 GA. TFF 600V	
SWITCH OUTPUT	10	#2 LOAD	CHECK CODE	
TB5	11	LINE	18 GA. TFF 600V	
SWITCH OUTPUT	12	#3 LOAD	CHECK CODE	
TB6	13	LINE	18 GA. TFF 600V	
SWITCH OUTPUT	14	#4 LOAD	CHECK CODE	

NOTE 1: Use 2 or 3 conductor shielded cable depending on analog device. Belden #8761(2); #8771(3) or equal.

TABLE 3-1 (CONTINUED)

TERMINAL DESIGNATION AND RECOMMENDED WIRE

Term.Block	Term.#	Function		Wire
8RO Cont'd.				
TB7 SWITCH OUTPUT	15 16	LINE #5 LOAD		18 GA. TFF 600V CHECK CODE
TB8 SWITCH OUTPUT	17 18	LINE #6 LOAD		18 GA. TFF 600V CHECK CODE
TB9 SWITCH OUTPUT	19 20	LINE #7 LOAD		18 GA. TFF 600V CHECK CODE
TB10 SWITCH OUTPUT	21 22	LINE #8 LOAD		18 GA. TFF 600V CHECK CODE
VS VARIABLE SPEED BOARD				
TB1	1 2	KW IN (PULSE)	+ -	TFF #18GA. TFF #18GA.
	3 4	PHASE FAIL (CONTACT)	+ -	TFF #18GA. TFF #18GA.
	5 6	SIGNAL(SUC) ANA(COM)	+ -	WHITE (note 1) SHIELD & COMMON
	7 8	SIGNAL(DISC) ANA(COM)	+ -	WHITE (note 1) SHIELD & COMMON
TB2	1 2	SIGNAL(TEMP1) ANA(COM)	+ -	WHITE (note 1) SHIELD & COMMON
	3 4	SIGNAL(TEMP2) ANA(COM)	+ -	WHITE (note 1) SHIELD & COMMON
	5 6	SIGNAL(TEMP3) ANA(COM)	+ -	WHITE (note 1) SHIELD & COMMON
	7 8	SIGNAL(TEMP4) ANA(COM)	+ -	WHITE (note 1) SHIELD & COMMON

TABLE 3-1 (CONTINUED)

TERMINAL DESIGNATION AND RECOMMENDED WIRE

Term.Block	Term.#	Function		Wire
VS VARIABLE SPEED BOARD (CONT'D.)				
TB3	1	SIGNAL(0IL)	+	WHITE (note 1)
	2	ANA(COM)	-	SHIELD & COMMON
	3	ANA.IN(0-10V)	+	WHITE (note 1)
	4	SPEED(COM)	-	SHIELD & COMMON
	5	ANA.IN(4-20mA)	+	WHITE (note 1)
	6	SPEED(COM)	-	SHIELD & COMMON
	7	12 VDC OUT	+	RED (note 1)
	8	ANA(COM)	-	SHIELD & COMMON
TB4 RS485	1	I/0	+	RED | 20GA 2COND.
	2	SERIAL	0V	SHIELD | BELDEN NO.
	3	I/O	-	BLACK | 9154*
TB5 (0-10V)#1	1	ANA.OUT	+	WHITE (see note 1)
	2	ANA.OUT	-	SHIELD & COMMON
TB6 (4-20mA)	1	ANA.OUT	+	WHITE (see note 1)
	2	ANA.OUT	-	SHIELD & COMMON
TB7 (0-10V)#2	1	ANA.OUT	+	WHITE (see note 1)
	2	ANA.OUT	-	SHIELD & COMMON
TB8 ALARM 1	1	SWITCH OUTPUT		18 GA. TFF 600V
	2	SWITCH OUTPUT		CHECK CODE
TB9 ALARM 2	1	SWITCH OUTPUT		18 GA. TFF 600V
	2	SWITCH OUTPUT		CHECK CODE
TB10	1	SIGNAL(IN)	+	NOT USED
	2	DEFROST(COM)	-	NOT USED
	3	CONTROL(OPT.)	+	NOT USED
	4	INVERTER(COM)	-	NOT USED
	5	CONTROL(RELAY)	+	NOT USED
	6	RESET(OPT.)	+	NOT USED
	7	INVERTER(COM)	-	SHIELD & COMM.
	8	RESET(RELAY)	+	BLACK NOTE: 1

* If over 2000 feet use 16 gauge 2 conductor with shield, Belden No. 8719 or equal. NOTE 1: Use 2 or 3 conductor shielded cable depending on analog device. Belden #8761(2); #8771(3) or equal.

TABLE 3-1 (CONTINUED)

TERMINAL DESIGNATION AND RECOMMENDED WIRE

Term.Block	Term.#	Function		Wire
VS VARIABLE SPEED BOARD (CONT'D.)				
TB11	1	ALARM (IN)	+	BLACK NOTE: 1
	2	INVERTER (COM)	-	SHIELD & COMM.
TB12	1	COMP. RUN (IN)	+	BLACK NOTE: 1
	2	PROOF (COM)	-	SHIELD & COMM.
	3	PUMP SPEED(IN)	+	NOT USED
	4	PUMP SPEED(COM)	-	NOT USED
TB14 POWER IN	1	AC1 10V		RED | 22GA 3COND.
	2	C.T.0V.5 AMP		SHIELD | BELDEN NO.
	3	AC2 10V		BLACK | 8762*

* If over 2000 feet use 16 gauge 2 conductor with shield, Belden No. 8719 or equal.
NOTE 1: Use 2 or 3 conductor shielded cable depending on analog device. Belden #8761(2); #8771(3) or equal.

3.2 TRC AND COMPONENT WIRING. After all components have been mounted and before turning on the power, wire as described in Table 3-1 and Drawings in Figures 3-1 through 3-9. The electrical wire specified in the table and on wiring diagrams may be substituted using an equal or heavier specification so long as local and national electrical codes are followed.

NOTE: Use only the knockouts provided. Any drilling or cutting of holes in the enclosure can cause serious operational problems and even failures to the controller. Any metal filings found in the boards can void the warranty.

3.3 RS-485 COMMUNICATION BUS. Terminating resistor jumpers JU1, JU2, and JU3 must be set as follows:

IMPORTANT: ALL BOARDS AT THE END OF THE RS-485 COMMUNICATION BUS REQUIRE TERMINATING JUMPERS FOR PROPER OPERATION OF THE SYSTEM. THESE JUMPERS ARE LOCATED ON EACH BOARD NEAR THE RS-485 TERMINALS.

ALL BOARDS ARE SHIPPED FROM THE FACTORY AS IF THEY ARE TO BE LOCATED IN THE MIDDLE OF THE BUS; THEREFORE REQUIRING NO CHANGES EXCEPT AS SHOWN BELOW FOR END-OF-BUS BOARDS. CHECK JUMPERS ON ALL BOARDS TO ASSURE THEY HAVE NOT BEEN CHANGED.

IMPORTANT: FOR THOSE 16AI, 8R0, VS, ALARM, AND TRC PIB BOARDS AT THE END OF THE BUS, IT IS NECESSARY TO MOVE THE TERMINATING JUMPERS UP INTO THE CONNECTED POSITION. USING A NEEDLE NOSE PLIERS, PULL THESE OFF AND REINSERT INTO THE TOP TWO PINS. SEE THE DIAGRAM OF EXAMPLES BELOW:

TRC-------16AI-----8RO------8RO------8RO

VS-------8RO-------TRC------16AI----ALARM

TRC-----16AI----16AI-----8R0----8RO---16AI

* Asterisk marked end boards will require that the terminating jumpers be changed as described above.

3.4 POWER REQUIREMENTS. Each 16AI, 8RO, and VS board requires a 20 volt AC power input. The 20 VAC volt input is to be from a transformer having a center tap on the secondary so as to have two 10 VAC lines to the neutral center tap. CPC has available transformers for this purpose. The transformers available are:

P.N. 640-0033	120V OR 208V INPUT 20VAC(10/10) OUTPUT **WILL DRIVE 2.8 AMPS.**	To calculate number of boards: 8RO = .75A 16AI= .25 VS = .50
P.N. 640-0035	120C OR 208V INPUT 20VAC(10/10) OUTPUT **WILL DRIVE 5.0 AMPS.**	
P.N. 640-0038	120C OR 208V INPUT 20VAC(10/10) OUTPUT **WILL DRIVE 8.8 AMPS.**	

The TRC main panel requires an input of either 120VAC or 208VAC. A field selectable set of jumpers on the TRC Power Interface Board need to be set for the voltage at the site of this installation. Jumpers JU7 and JU8 must be in position for either 208V or 120V as required. **IMPORTANT:** Check to assure that these jumper are proper. Up is 208V and down is 120V.

BEFORE POWERING UP THE SYSTEM, READ SECTION IV FOR DIP SWITCH SETTINGS. THESE MUST BE SET PROPERLY BEFORE APPLYING POWER TO THE UNIT, CHECK ALL CONNECTIONS AND VERIFY THAT THE SUPPLY VOLTAGE JUMPERS ARE IN THE PROPER POSITION

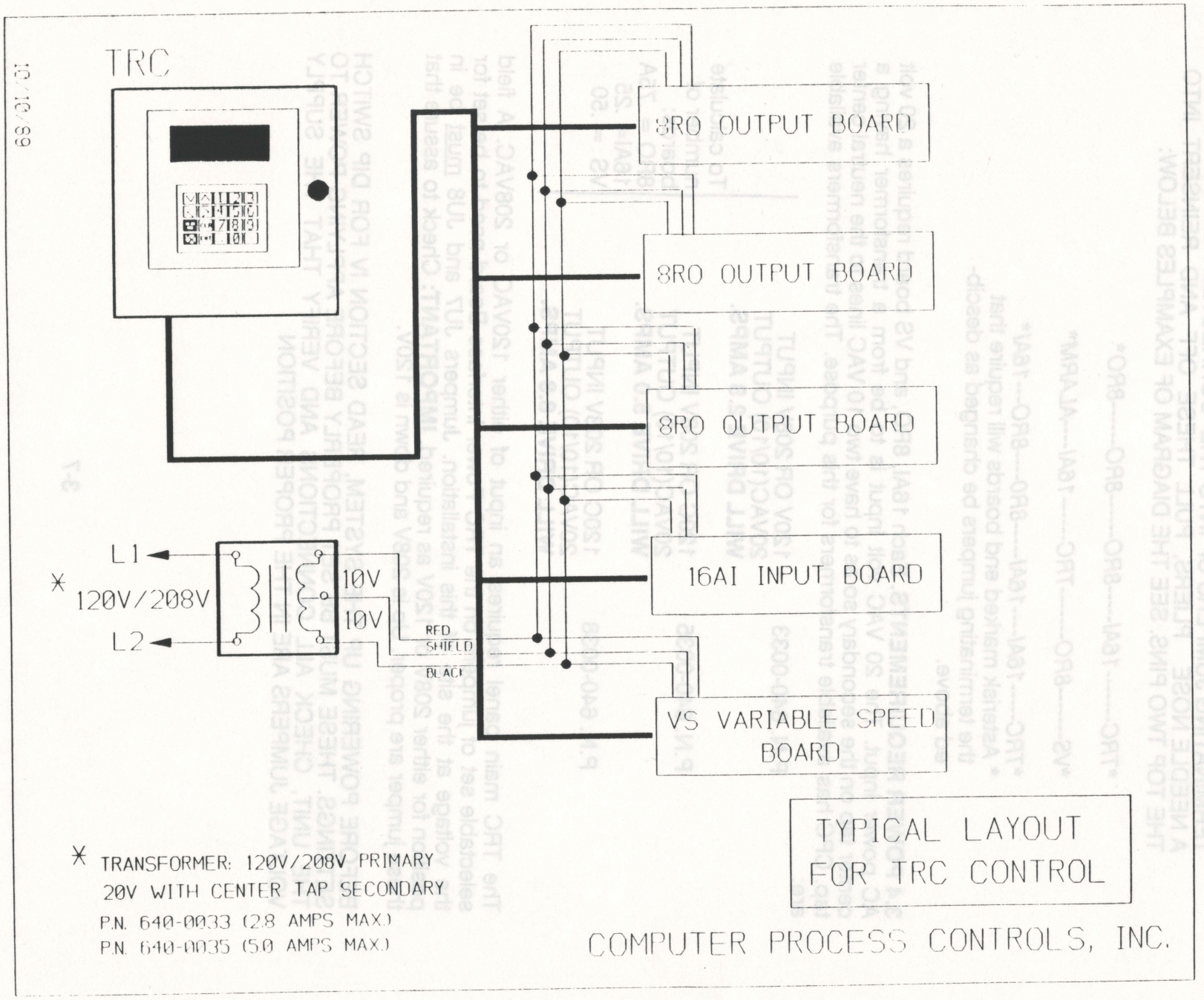


FIG. 3-1
TRC LAYOUT

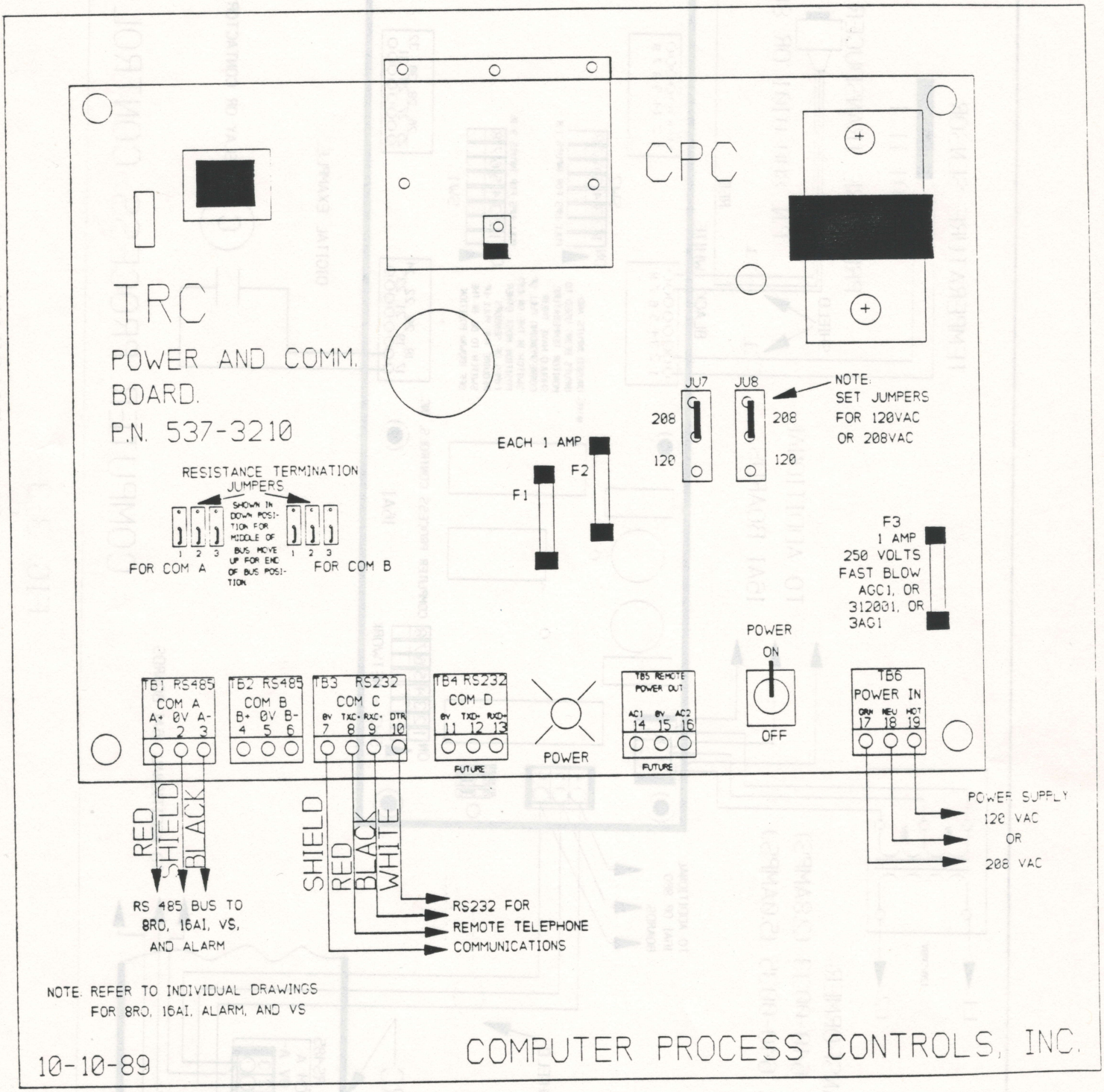


FIG. 3-2

TRC MAIN PANEL WIRING

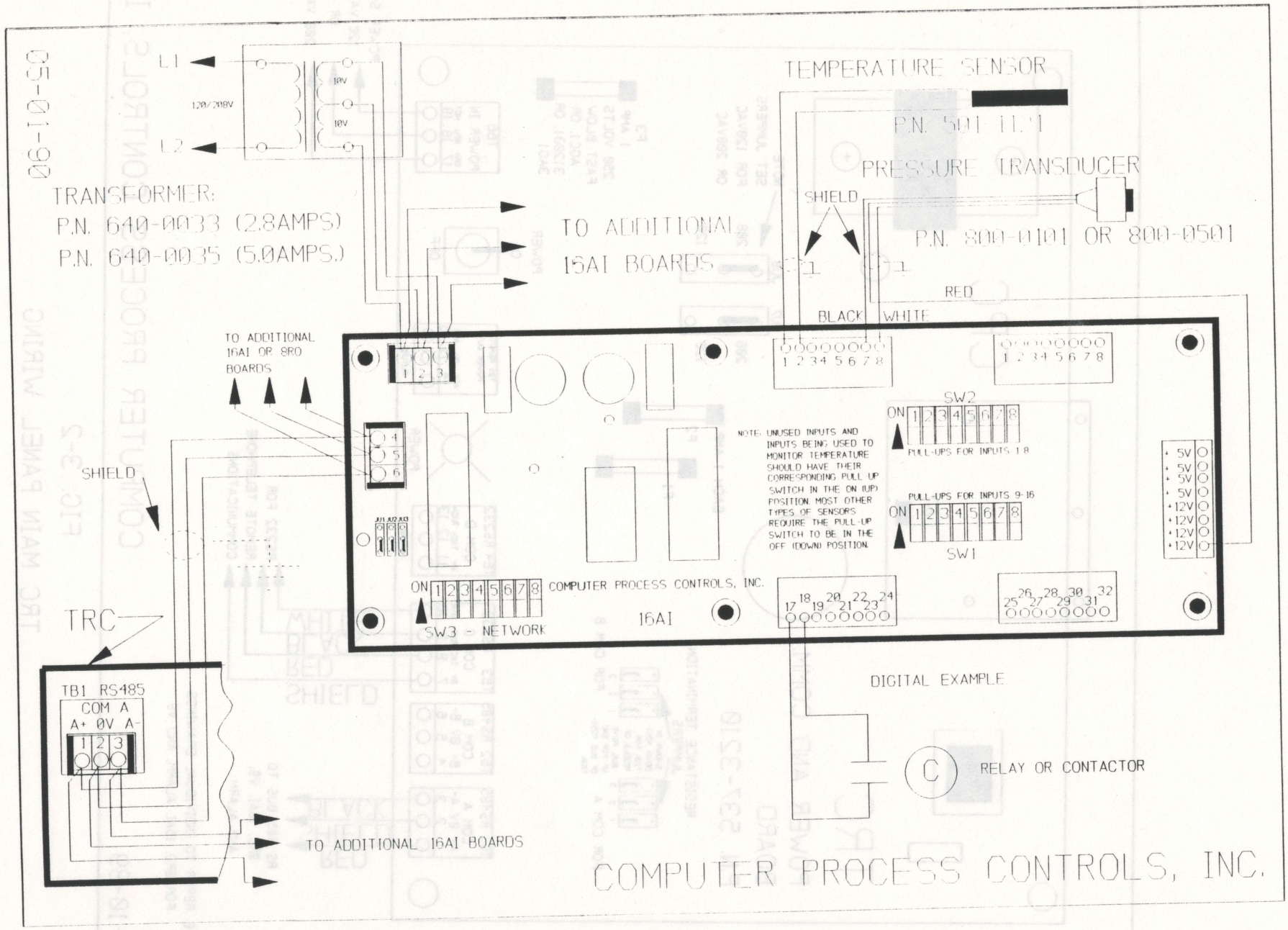


FIG. 3-3

TRC INPUT WIRING DIAGRAM

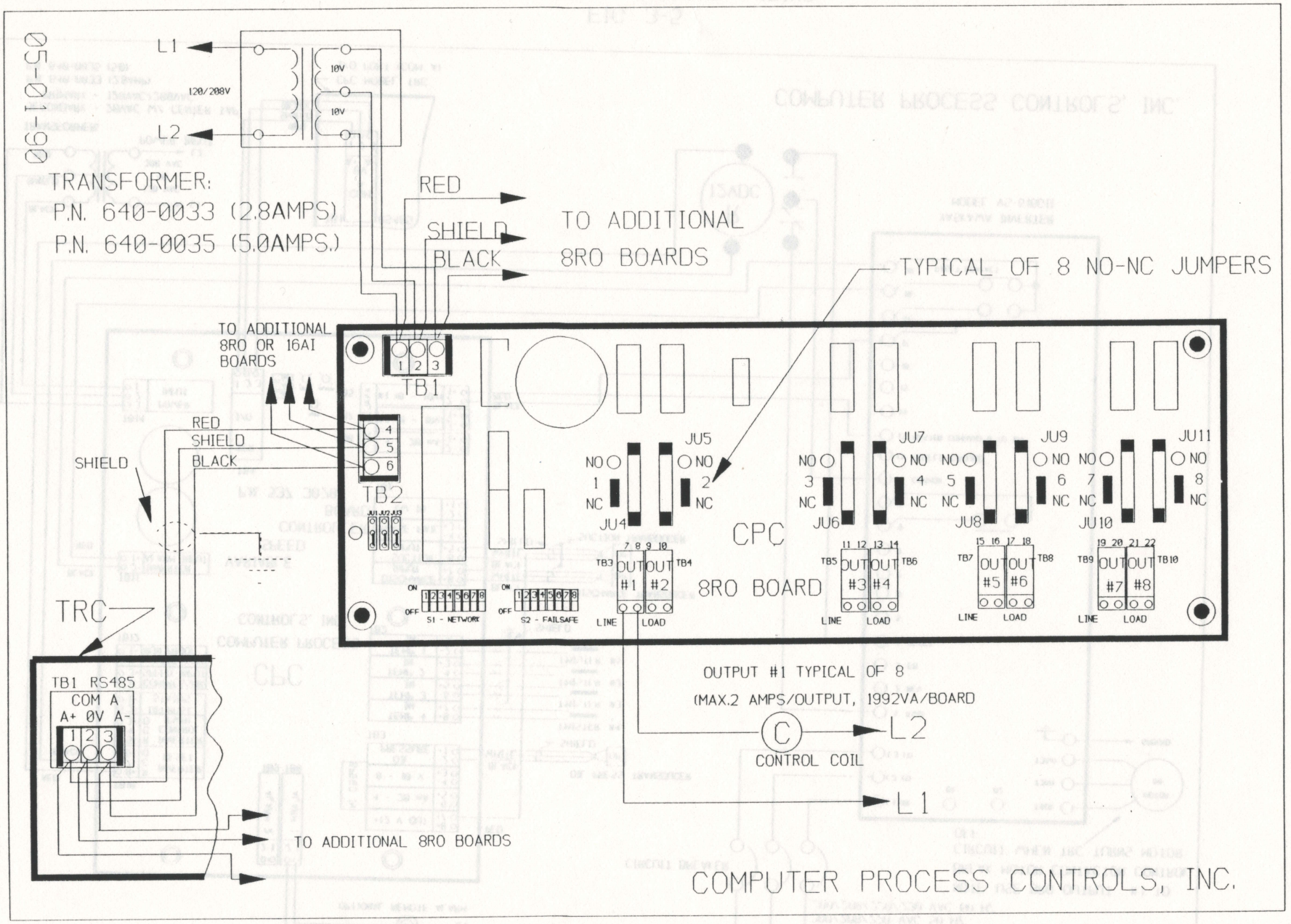


FIG. 3-4

TRC OUTPUT WIRING DIAGRAM

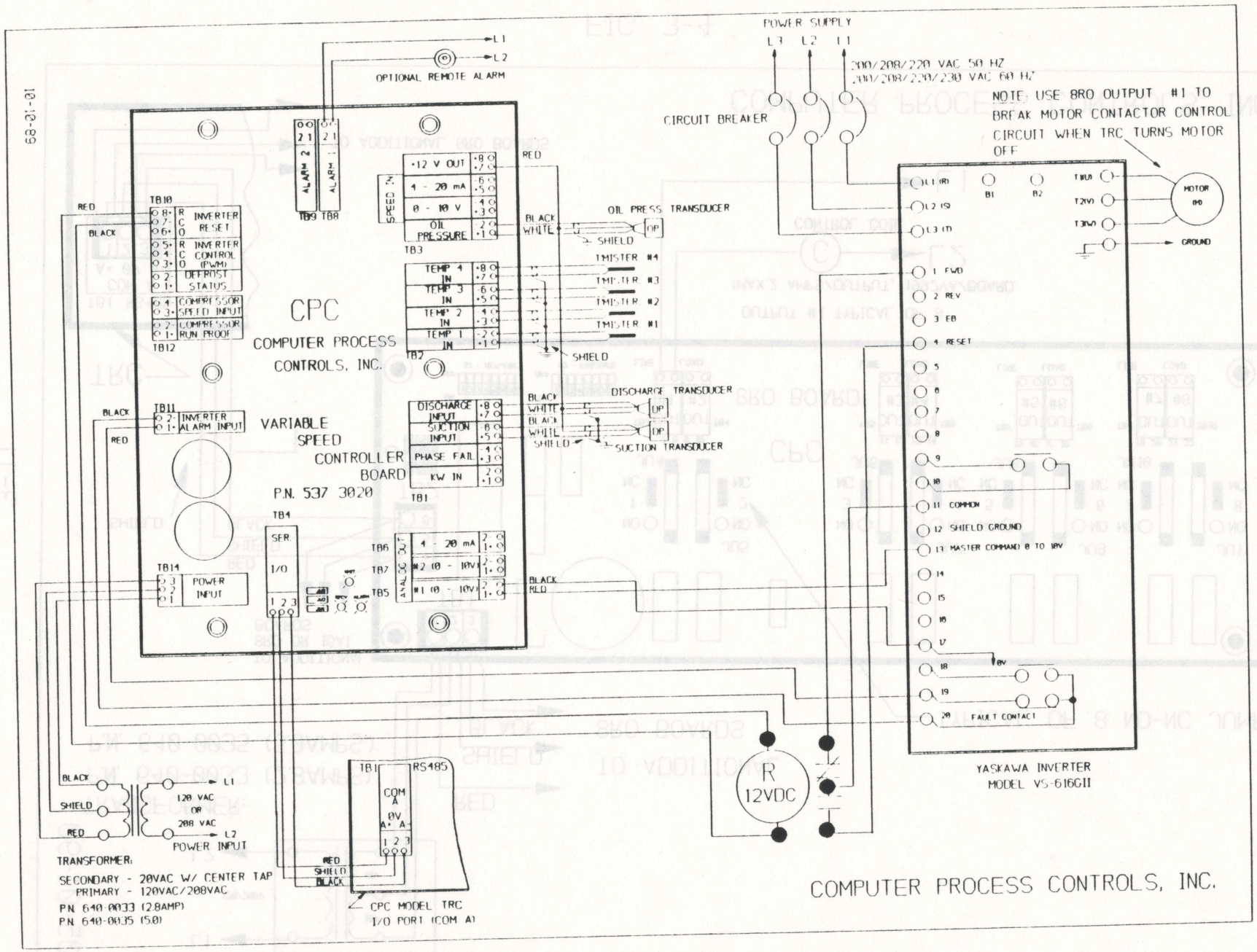


FIG. 3-5
TRC VARIABLE SPEED WIRING
FOR YASKAWA #616GII

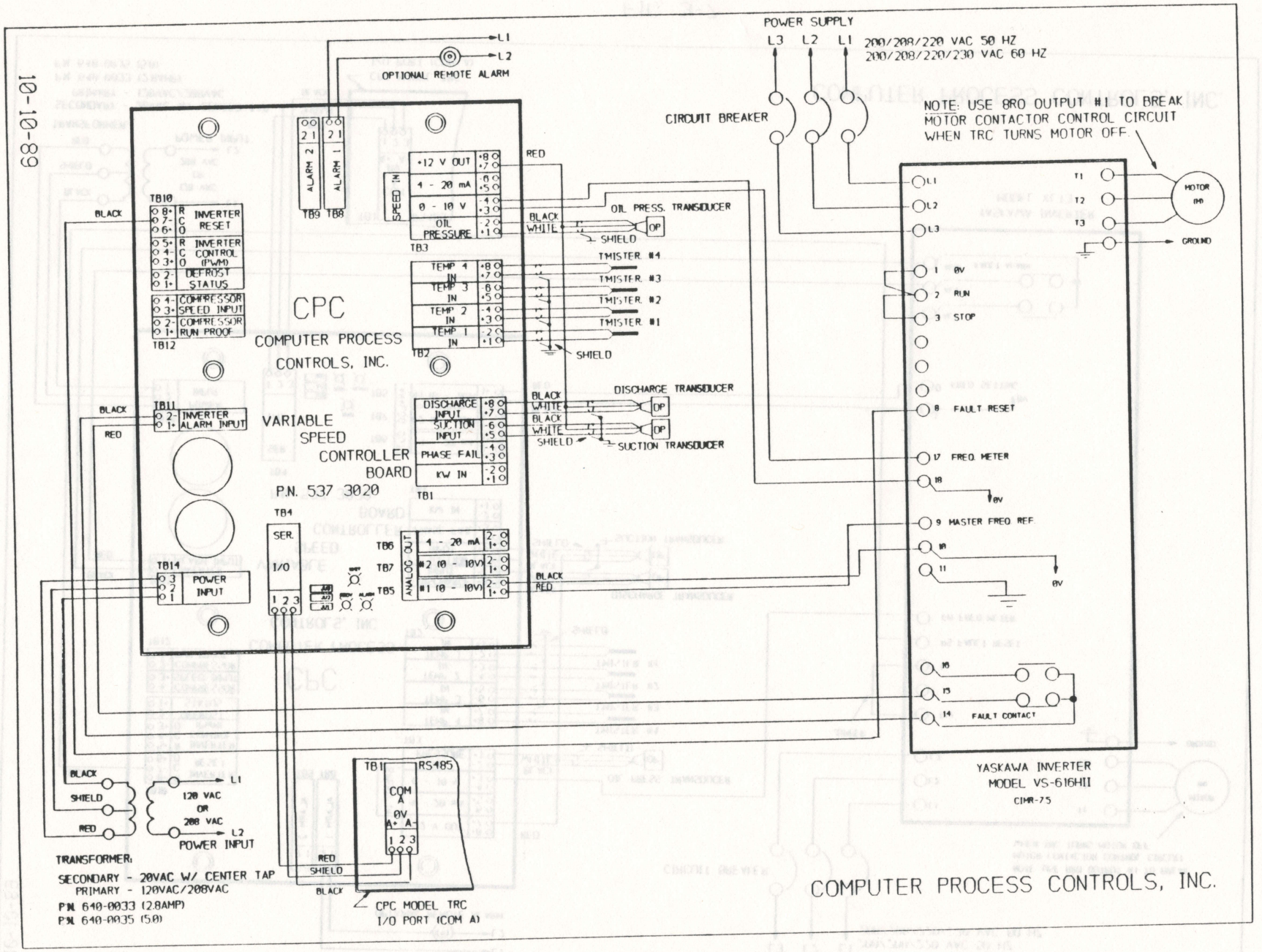


FIG. 3-6
TRC VARIABLE SPEED WIRING
FOR YASKAWA #616HII

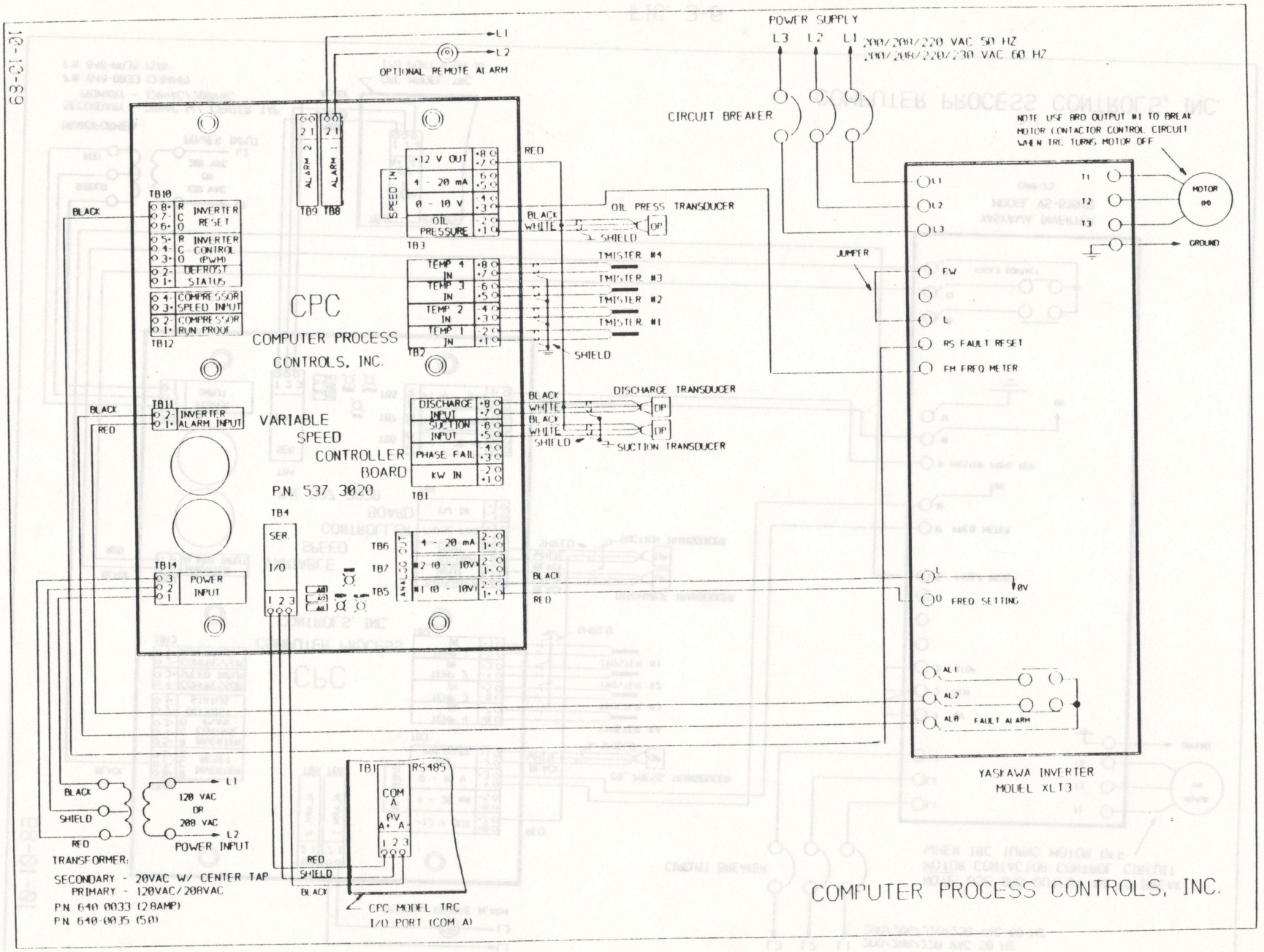


FIG. 3-7
TRC VARIABLE SPEED WIRING
FOR POLYSPEDE XLT3

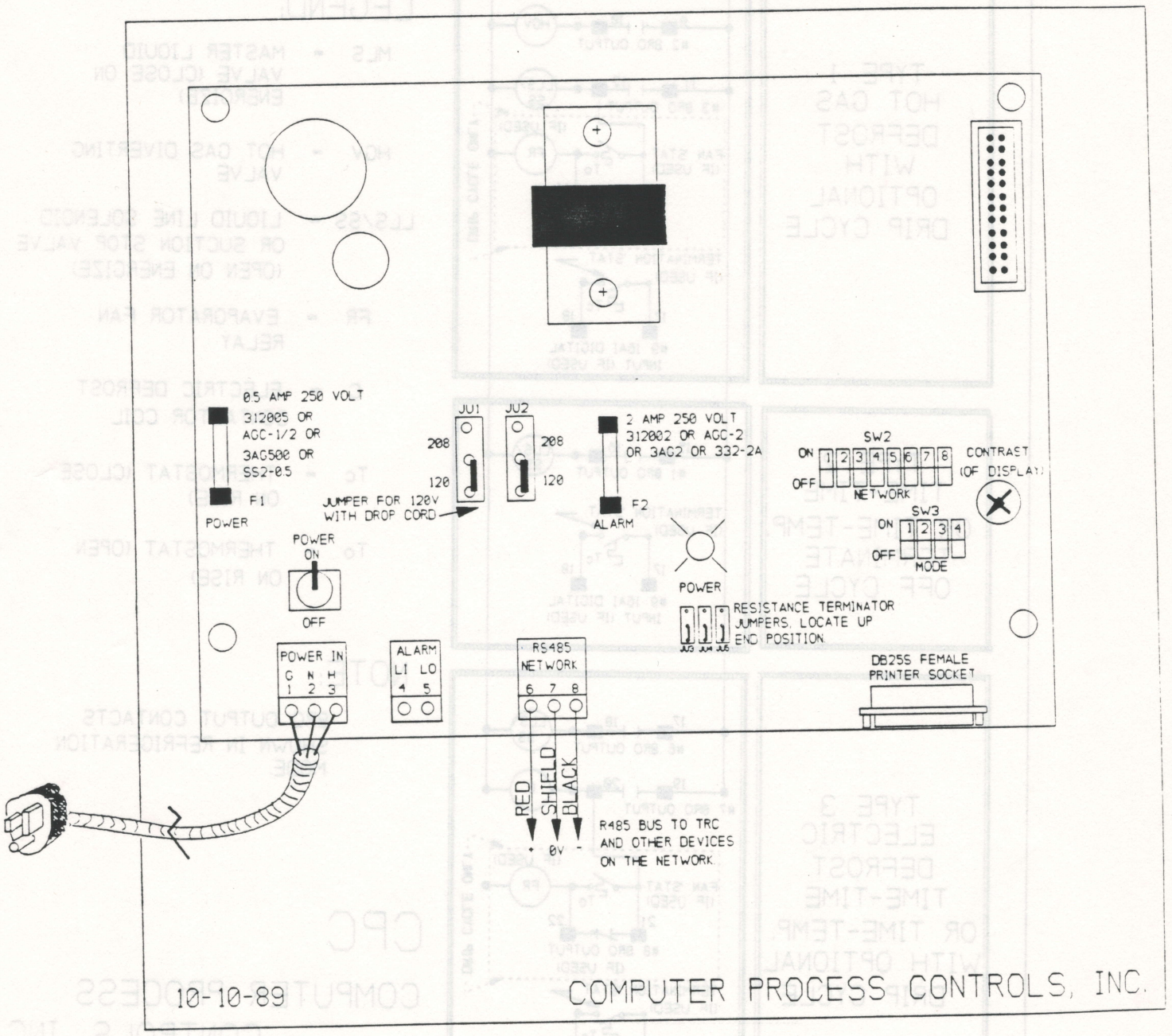


FIG. 3-8

ALARM - 485 (OPTION) WIRING

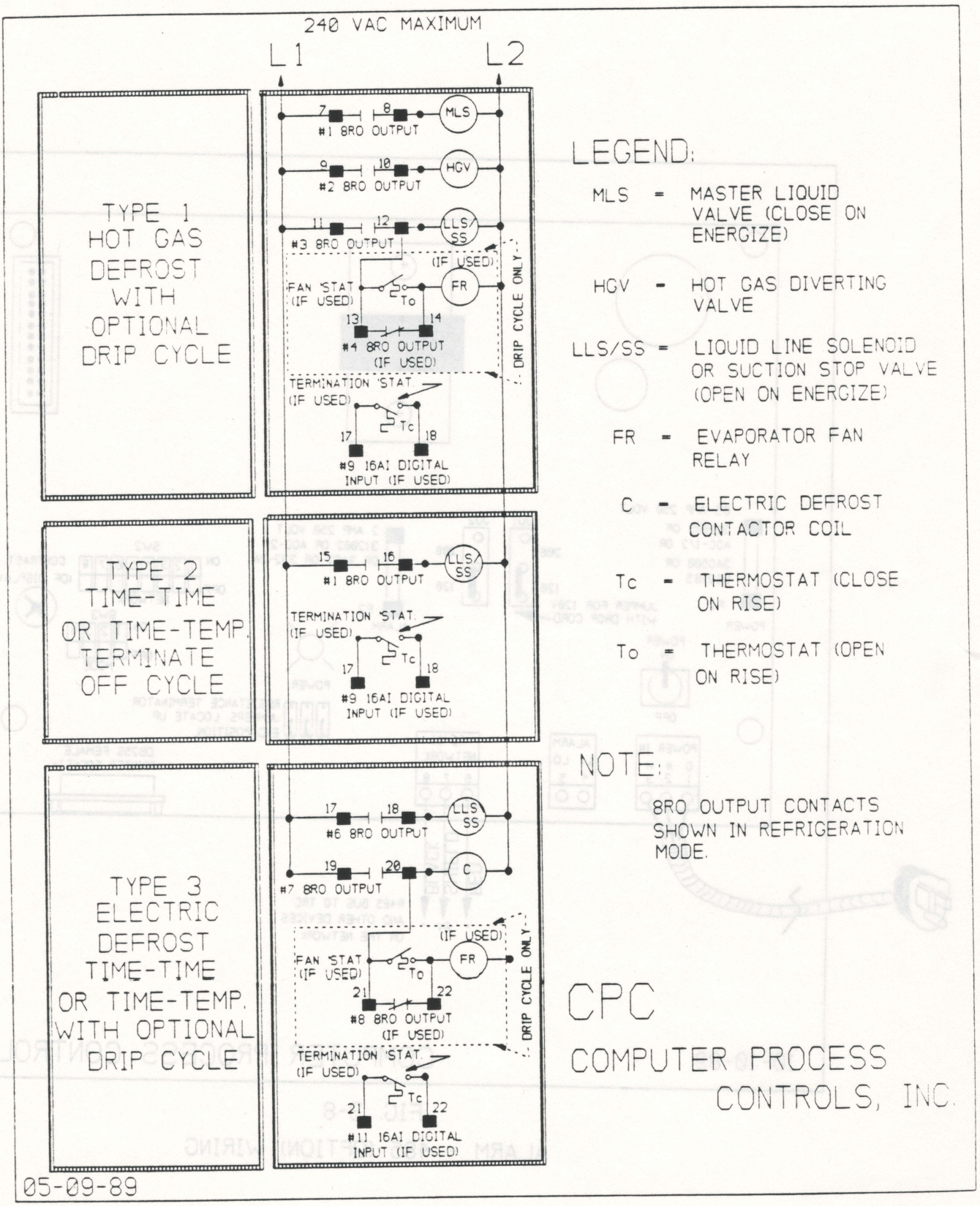


FIG. 3-9
TRC DEFROST WIRING

SECTION IV

TRC QUICK SET-UP GUIDE

The following steps are required to set up a TRC prior to placing it in operation.

4.1 INITIAL SET UP.

Install per wiring diagrams and SECTION III FIELD WIRING. Check TRC power jumpers JU7 and JU8 to make sure these are set for the proper voltage that will be applied. See Fig. 4-1.

4.2 NETWORK SWITCHES

Set the network switches for unit numbers on the Input, Output, and Variable Speed Board. See Fig. 4-2 for additional details.

	Switch No.			
Unit No.	1	2	3	4
1	1	0	0	0
2	0	1	0	0
3	1	1	0	0
4	0	0	1	0
5	1	0	1	0
6	0	1	1	0
7	1	1	1	0
8	0	0	0	1
9	1	0	0	1
10	0	1	0	1
11	1	1	0	1
12	0	0	1	1
13	1	0	1	1
14	0	1	1	1
15	1	1	1	1

Number each type of board from 1 to ?? depending on how many you have. i.e. output boards are numbered 1-15, input boards 1-7 .

Leave switch 6 off (down) and set switch 7 on the network switch for each 8RO, each 16AI, and the VS Variable Speed Board up (closed or on) for 4800 Baud communications. (See Fig. 4-2)

TRC Baud Rate. For the TRC S-1 NETWORK (on board inside door) set switch 1 on the network switch up (closed or on) and switch 2 down (open or off) for 4800 Baud communications on COM A (RS485) to input, output, and variable speed boards. S-1 NETWORK switches 3 & 4 are for a future additional RS485 on COM B. Switches 5 & 6 are for RS232 COM C connection for remote telephone communications. Switches 7 & 8 are not used. For each of the switch pairs different baud rates may be selected by setting the switches as follows:

TRC S-1 NETWORK

	SWITCH NO.*						
BAUD RATE	1	2	3	4	5	6	7 8
	RS485		RS485		RS232		RS232
FOR:	COM A		COM B		COM C		COM D
300	-	-	-	-	0	0	
1200	-	-	-	-	1	0	
2400	0	0	0	0	0	1	NOT
4800	1	0	1	0	-	-	USED
9600	0	1	0	1	1	1	
19200	1	1	1	1	-	-	

*1 = UP (ON); 0 = DOWN (OFF).

4.3 TERMINATION JUMPERS

Set Termination Jumpers. Move only the ones on units at the end of the network. The Termination Jumpers are the blue plugs on the left edge of the boards and at the bottom left of the TRC power board. See SECTION III paragraph 3.3.

4.4 NO/NC JUMPERS AND OUTPUT RELAY FAIL SAFE SWITCHES

Set NO/NC jumpers (JU4 - JU11) and fail safe switches (S2 1-8) on the 8RO Relay Output Boards. Set switches to match your jumper position as follows:

SITUATION "A": **Jumper up to NO** **Switch Down (OFF)**
Contacts closed when relay coil is energized. Fail Safe condition is load off. When TRC says "ON" LED is on, relay coil is energized and load is "ON".

SITUATION "B": **Jumper down to NC** **Switch Up (ON)**
Contacts closed when relay coil is de-energized. Fail Safe condition is load on. When TRC says "ON" LED is on, relay coil is de-energized and load is "ON".

SITUATION "C": **Jumper up to NO** **Switch Up (ON)**
Contacts closed when relay coil is energized. Fail Safe condition is load off. When TRC says "ON" LED is on, relay coil is energized and load is "ON". (Used for unloaders primarily)

See Fig. 4-3 for additional details.

Unplug network cable from TRC. This will force the loads to be in "fail safe" condition during initial programming.

4.5 INPUT TEMPERATURE/TRANSDUCER SWITCHES

Set Switches located at right center of 16AI INPUT BOARD. Up for temperature, Down for pressure transducers. See Fig. 4-4 for input switch setting details.

4.6 INITIAL PROGRAMMING

4.6.1 Turn on TRC. Set screen contrast using small dial on inside of door. Log on with password "400" or just press "ENT" to view only. Password level 400 allows one to make password changes, configuration changes, and all setpoint changes, and all other possible changes. Passwords 100, 200, and 300 limit the user in the area of bypassing, configuration changes, and password changing. For the initial programming it is suggested that the "400" password be used.

4.6.2 Select Item 7, CONFIGURATION. Press 6, for NETWORK MENU.

4.6.3 Select Item 7, SET DEVICE #'S.

4.6.4 Set device numbers to match switches. Enter "0" for boards not used. Press ENTER after each entry. Enter "0" for Alarm-485 (option) when asked. When done, press ENTER, to return to CONFIGURATION Menu.

4.6.5 Select 1. INPUT DEFINITION. This is where you tell the controller where the inputs are actually wired on the boards. You will need a wiring diagram or need to know just where they are wired. Press the ARROW KEYS TO MAKE CHANGES. Once you type in a new number, simply arrow to your next choice. Note that there are several pages of inputs. Don't worry about the ones you are not using, but make sure you have assigned properly all those that you are. Press "0" to exit when you are done with inputs.

4.6.6 Press 2. OUTPUT DEFINITIONS. This is where you tell the controller where the outputs are wired. Just like the inputs, use the arrow keys and enter in the proper board and output number for each compressor, defrost, condenser fan, etc. Press "0" to exit to the CONFIGURATION SCREEN.

4.6.7 Press 3, System Information. Set the clock by arrowing to the date, then enter the time. The day must be set in by entering the first three letters of the day. Use the blue key for the blue letters, the red key for the red letters.

4.6.8 Go to bottom or top of screen and press "0" to exit.

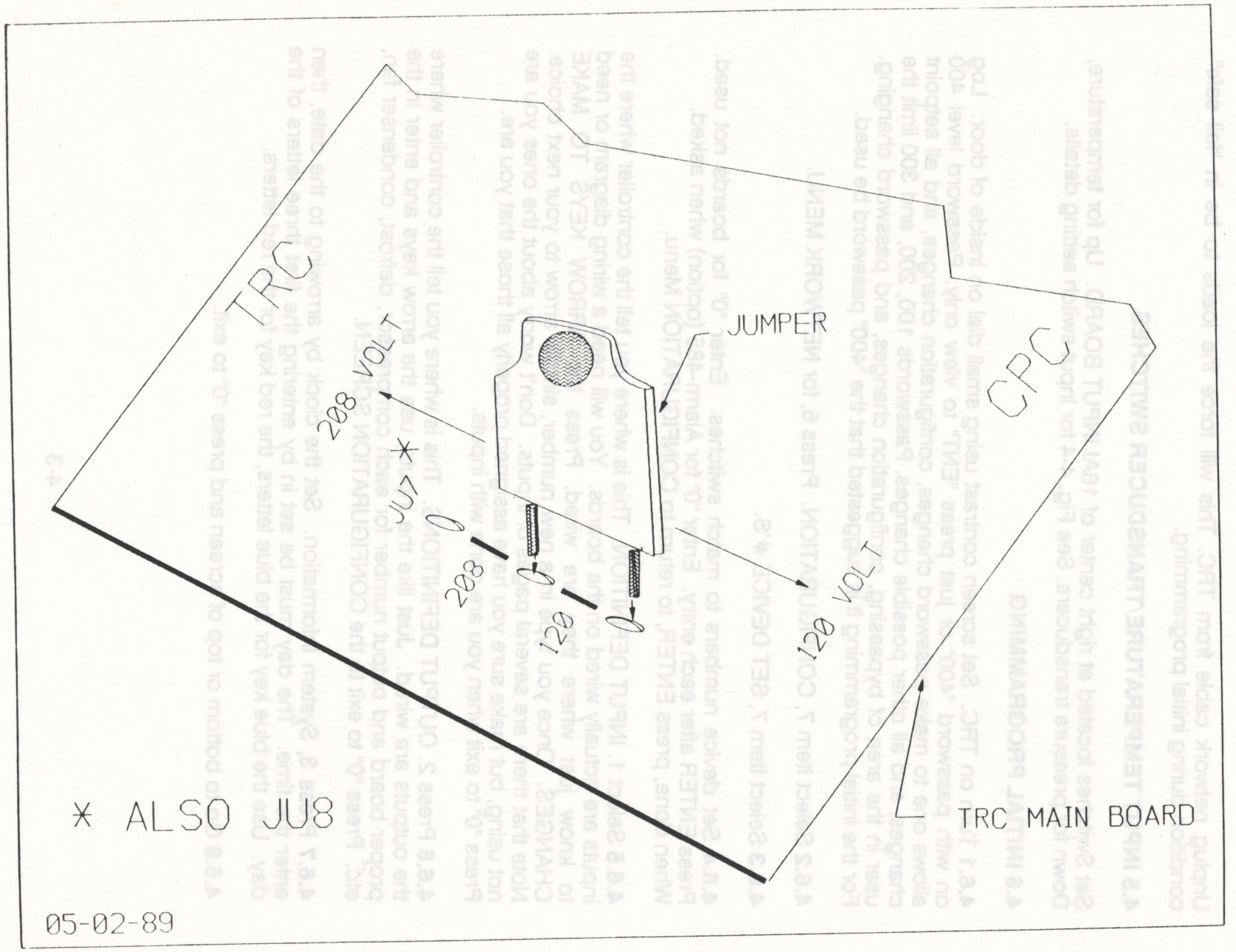
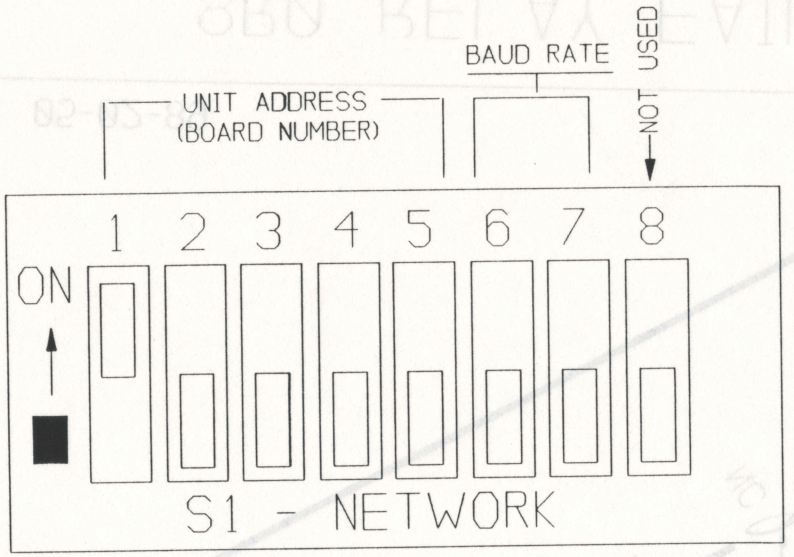


FIG. 4-1

TRC POWER VOLTAGE JUMPER



UNIT NUMBER:

This is the number assigned to each 16AI input board, 8RO output board, and the VS Variable Speed board.

Set switch positions 1-5 as shown in this table where 1 = on (up) and 0 = off (down).

Unit No.	Switch No. 1	2	3	4	5
1	1	0	0	0	
2	0	1	0	0	
3	1	1	0	0	
4	0	0	1	0	
5	1	0	1	0	
6	0	1	1	0	
7	1	1	1	0	
8	0	0	0	1	
9	1	0	0	1	
10	0	1	0	1	
11	1	1	0	1	
12	0	0	1	1	
13	1	0	1	1	
14	0	1	1	1	
15	1	1	1	1	

SET OFF (DOWN)

BAUD RATE:

Set switch positions 6 & 7 for the network communication baud rate in accordance with the following table where 1 = on (up) and 0 = off (down).

Baud Rate	Switch No. 6	7
1200	0	0
2400	1	0
4800*	0	1
9600	1	1

* 4800 is reccommended

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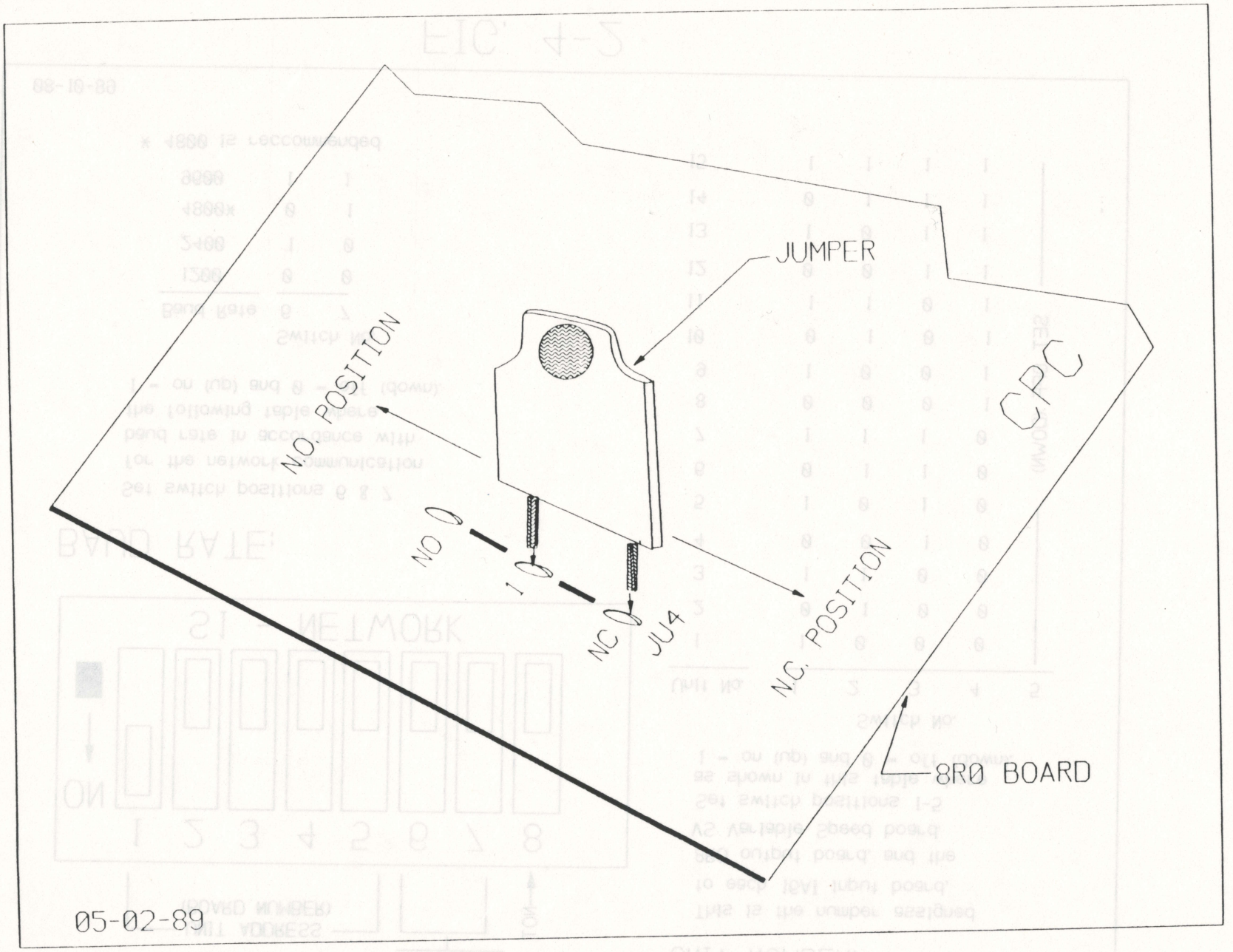
FIG. 4-2

NETWORK SWITCH



8RØ RELAY FAILSAFE JUMPER

FIG. 4-3

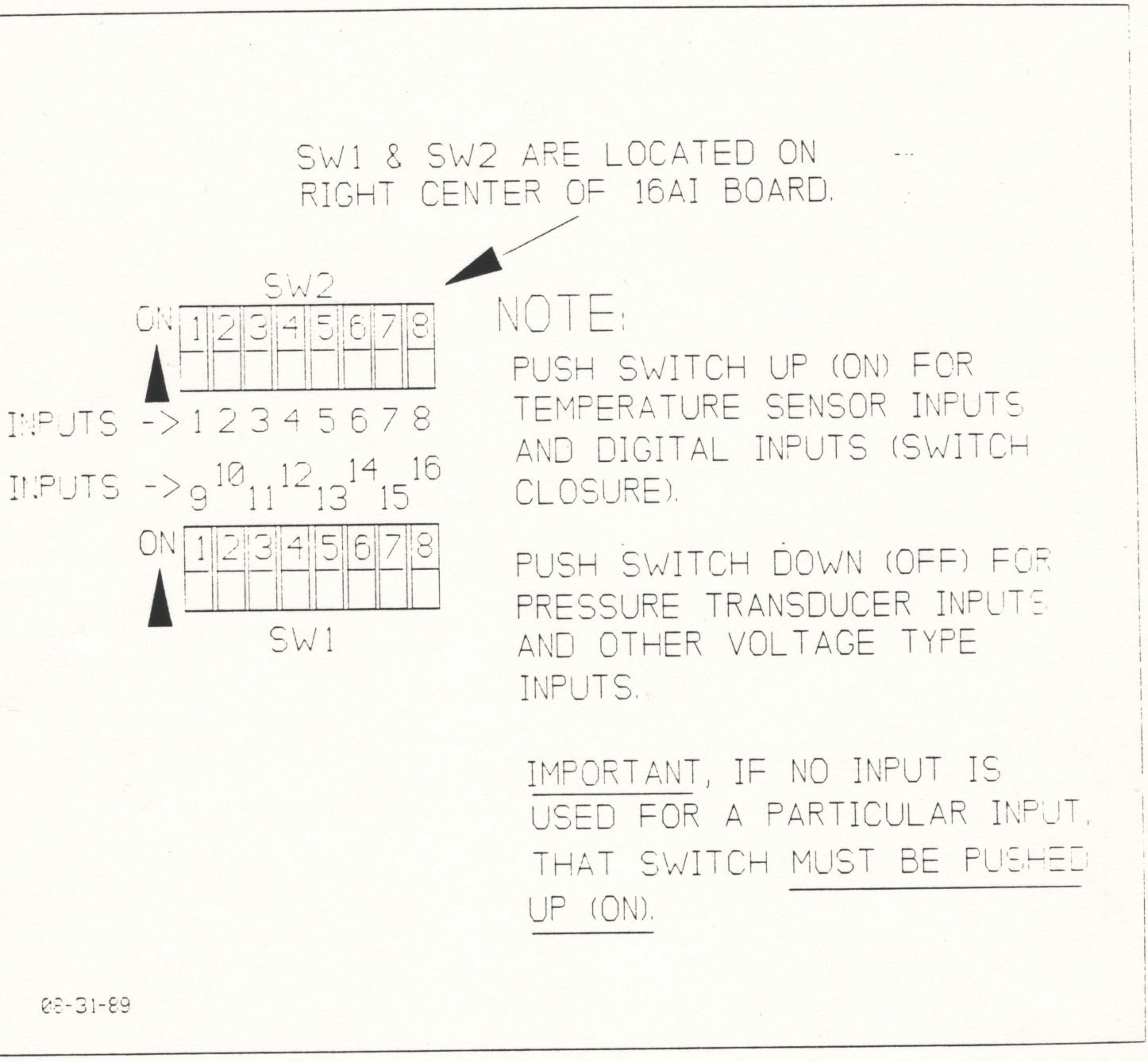

SW1 & SW2 ARE LOCATED ON
RIGHT CENTER OF 16AI BOARD.
SW2
ON
1 2 3 4 5 6 7 8
INPUTS -> 1 2 3 4 5 6 7 8
INPUTS -> 9 10 11 12 13 14 15 16
ON
1 2 3 4 5 6 7 8
SW1
NOTE:
PUSH SWITCH UP (ON) FOR TEMPERATURE SENSOR INPUTS AND DIGITAL INPUTS (SWITCH CLOSURE).
PUSH SWITCH DOWN (OFF) FOR PRESSURE TRANSDUCER INPUTS AND OTHER VOLTAGE TYPE INPUTS.
IMPORTANT, IF NO INPUT IS USED FOR A PARTICULAR INPUT, THAT SWITCH MUST BE PUSHED UP (ON).
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FIG. 4-4

INPUT SWITCH SETTINGS

SECTION V

THE MENUS

5.1 THE MAIN MENU.

5.1.1 Read Sections I, II, III, and IV before turning on the unit. All wiring must be complete and the initial programming accomplished. When the unit is turned on and the password entered the screen will display the Main Menu. Refer to Appendix B for a flow diagram of all menus.

```
CPC -MAIN MENU-                                          09:13

        1-Pressure Control                  5-Main Status
        2-Condenser Control                 6-Logs
        3-Defrost Control                   7-Configuration
        4-Sensor Control                    8-Graphs
                                            9-Alarms

  Make Selection                                    0=LogOff
```

5.1.2 At the Main Menu the selection of menus 1 through 9 is available to the user to view data or set controls. From the Main Menu one may log off, also.

5.2 PRESSURE CONTROL SET UP AND SET POINT ENTRY

5.2.1 At main menu on TRC press 1 for Pressure Control.

```
        CPC -PRESSURE MENU-                                 11:00
        1-Status                            4-Logs
        2-Setpoints                         5-Bypass
        3-Alarms                            6-Set-up

  Make Selection                                    0=Main
```

5.2.2 Press Item 6, SET UP

```
CPC -PRESSURE SETUP-                                        11:01
Defr -          Force Comp On       : Y
                Lead Circuit No.    : 01
                Inhibit Float       : Y
                Float Delay Time:   : 10m
  Run Comp During Reclaim           : Y
  One Comp Remain On                : N          Phase  : Y

^ =Menu,      |=Next,          9=Main                0=Main
```

5.2.3 Use RIGHT ARROW key to move to selections. Make choices for defrost. You can choose to force a compressor to run during defrost, during reclaim, or to run continuously, with the choice "ONE COMPRESSOR REMAINS ON". You must be monitoring reclaim with an input to use the reclaim option. Phase loss may be used if monitoring a phase monitor device on one of the input boards.

CPC -PRESSURE SETUP-					11:08
Out #	01	02	03	04	05
Type	VS	UNLD	COMP	COMP	....
Run Times	00004	00004	00000	00000	00000
Oil Press	00.0	00.0	00.0	00.0	00.0
H. Power	015	008	008	004	000
Proof	NO	NO	NO	NO	NO
^ =Prev,	|=Next,		9=Main		0=Main

5.2.4 Use the RIGHT ARROW to make selections based on the prompt line at the bottom of the screen. The oil pressure setting (0 - 99 psi range) is the oil failure shut down point. Set to 0 if not using. This is the actual oil pressure.

The HP setting is the capacity setting for the compressor. This may be set in Horsepower, MBTU's, or any number that shows accurately the capacity proportional relationship between compressors and unloaders. For unloaders, enter the capacity unloaded for the compressor, and the capacity of the unloading stage only for the unloader.

The PROOF is to tell the controller if you have connected a status input for the compressors. Continue for compressors 6 thru 13 by using the down arrow.

Use the UP ARROW to get back to the PRESSURE MENU.

CLEAR ANY UNUSED COMPRESSORS BY ENTERING "X" FOR THE TYPE.

5.2.5 Press 2, for Pressure Set Points.

CPC -PRESSURE SETPOINTS-				11:13
	Group 1	Group 2	Discharge	
		Disabled		
Setpoint	12.0	14.9	Trip: 350	
On Delay	030s	020s	Delay:005s	
Off Delay	0010s	015s	Reset: 50	
^ =Menu,	|=Next,	9=Alm	0=Main	

5.2.6 Use RIGHT ARROW for set point of group one suction pressure.(Range 0 - 99 psi) and on/off delays. Set enabled or disabled for the second suction group depending on if you have two suction manifolds or not. Set discharge pressure set points as well.

5.2.7 Press the DOWN ARROW to go to the next Pressure Setpoint screen.

```
CPC -FLOATING SUCTION SETPOINTS-                                    11:23
Float On/Off:  OFF
Target Temperature                  : 010
Using:  AVG  of                       T1:Y        T2:Y        T3:Y    T4:N
Max. Suction Pressure          :              25:0
Min. Suction Pressure          :              08.0
Float Interval          :             15m

^ =Menu,          |=Next,          9=Alm          0=Main
```

5.2.8 Use DOWN ARROW for floating set points and probe selections. If you are using more than one floating probe, place Y in for the appropriate probes.

5.2.9 Use DOWN ARROW for Satellite settings. Disregard if not using satellites.

```
CPC -SATELLITE SETUP-                                               11:28
     Satellite                  #1          #2
          Type          :       TEMP        ....
          CutIn         :       033         000
          CutOut        :       028         000
          Delay         :       060s        000
          Run Time      :       00020       00000

^ =Prev,          |=Next,          9=Alm          0=Main
```

5.2.10 Use DOWN ARROW for Variable Speed Screen. Use RIGHT ARROW to enter settings. DO NOT CHANGE P.I.D. SETTINGS. Set dead band to 6 or less.

Optional speed verification signal can be either 0-10 Volts or 4-20ma depending on the inverter you are using. Normally it is 0-10V. This is the signal coming from the inverter to the controller to verify actual speed.

```
CPC -VARIABLE SPEED SETPOINTS-                                      11:28
Min. Speed:  0900 rpm                          Max. Speed:  1800
Max. Increase Rate::                6000rpm/minute
Max. Decrease Rate::                6000rpm/minute
Deadband:          02
P:     10.00       I:      00.10        D:      10.00        Scan:     02
Speed Verification                      (10V/4-20):          10V

^ =Prev,          9=Alm                                     0=Main
```

5.2.11 Use up arrow to get back to a prompt 0=Main. Enter "0" to exit to MAIN MENU.

NOTE: Turn OFF the TRC power to set the above setpoints, then turn ON again.

5.2.12 Pressure Logs (past history) may be viewed by returning to the Main Menu and pressing 1 for Pressure Control, and then from the Pressure Control Menu press 4 for Logs.

CPC -PRESSURE LOGS- #330 of 579 11:30

DATE	TIME	SUCT	DCHG	T1	T2	T3	T4
09/21	15:27	12.0	225	02	04	02	03
09/21	15:24	12.0	225	02	04	02	03
09/21	15:21	12.0	225	02	04	02	03
09/21	15:18	12.0	225	02	04	02	03
09/21	15:15	12.0	225	02	04	02	03

^ =Prev,Page |=Next Page 9=Alm 0=Main

The screen shows 5 logs of the suction pressure, discharge pressure, and the four temperature inputs (T1, T2, T3, & T4). The logs are entered for the each logging interval that is set from the Pressure Control Menu under (3) Alarms. The above example has a logging interval of 3 minutes. By depressing the down arrow one can see the most recent logs; or by depressing the up arrow see the oldest logs.

5.3 CONDENSER CONTROL

5.3.1 From main menu select 2 if you are using CONDENSER CONTROL.

CPC -CONDENSER STATUS- 11:43

Fan Status	01	02	03	04	05	06	07	08
	ON	0N	0N	0N	0N	0N	..	..

Current: OPN Cut-On: 200 Delay: 030s
Control Using PRESSURE
Equalize Runtimes: NO # Fans: 6

^ =Menu, |Next, 9=Alm 0=Main

5.3.2 Use DOWN ARROW for settings.

CPC -CONDENSER SETPOINTS- 11:43
Cut-On: 200 Deadband: 10 Delay: 030s
Fast Recovery @ 15 lbs/deg above setpt
Fast Recovery delay between fans: 006s
Control Using : PRESSURE
Equalize Runtimes : Y

^ =Prev, |Next, 9=Alm 0=Main

5.3.3 Use RIGHT ARROW for cut-on setting and time delay, # of fans, etc. Press down arrow to view Condenser Runtimes and On/Off Fan status; then press "0" to exit.

5.4 DEFROST CONTROL

5.4.1 From the Main Menu Press 3 if you are using DEFROST CONTROL.

```
CPC -DEFROST STATUS-                                          11:51
N=Normal,  D=Defrost,  M=Manual,  R=Run-off
O1   02   03   04   04   05   06   07   08   09   10   11  12
N    N    N    N    N    N    N    N    N    N    N    N    N
13   14   15   16   17   18   19   20   21   22   23
N    N    N    N    N    N    N    N    N    N    N

^=Menu,          |Next,          9=Alm                  0=Main
```

5.4.2 Press DOWN ARROW to enter times for defrost.

```
CPC -DEFROST SETPOINTS-                                       11:59

Circuit No:   12          Status:  N                  Type:  ELC
     Duration:            030m                  Run-off:        00m
     Term. Type:          SEN              Term.Point           030
  Start Times:            1-06:00          2-18:00          3-NONE
                          4-NONE           5-NONE           6-NONE

^=Prev Circuit          |Next Circuit                       0=Exit
```

5.4.3 Press RIGHT ARROW to begin entering settings.
5.4.4 Enter STATUS and TYPE using color keys and letters. Enter duration, run-off time, termination type, termination point (if using sensor), and start times.
5.4.5 To temporarily manually defrost a circuit change the status to "M" (Manual) in the setpoints menu by pressing RED and then M with cursor on status. Defrost will then be abled and run for failsafe time (duration) or fterminate on termination if used. It will automatically reset to it's defrost type.
5.4.6 Use DOWN ARROW to go to additional defrost screens. After completing all circuits enter "0" to exit. then 0 for Main Menu.

5.5 SENSOR CONTROL

5.5.1 At main menu on TRC press 4 for Sensor Control.

```
CPC -Sensor Setpoints-                                        09:05

1-Status                                          2-Setpoints

Make Selection                                              0=Main
```

5.5.2 Press 2 to bring up the Sensor Setpoints screen.

CPC -Sensor Setpoints-			09:05
No.:08 Status:OFF	Name:Meat Case 1,2,3,4		
Type: Temp	Using AVG of	009,010,011	
Current Values:	032 of	030,034,032,032	
On @ 034	Dly 060s	Off @ 028	Dly 005s
Alarms:	High 038	Low 025	Dly 060m
Notices:	High 036	low 027	Dly 060m
^=Prev, Page	|=Next Page	9=Alm	0=Main

(The values shown above are used in the examples below)

5.5.3 Using the right arrow (or left, or up, or down arrows) one can select from the following items for programing the particular sensor number. The sensor number (1 - 32) can be changed by using the up and down arrows:

Name: 15 alpha/numeric char. *Example: Meat Case 1,2,3,4*

Type: T = Temperature in ^{O}F;
1 = 0 - 100 psig pressure;
5 = 0 - 500 psig pressure.
Example: Temp.

Using: Sensors No. (one selected) plus up to three others for
(O) = Only (for just the one selected)
(A) = Average (for the one selected plus the other 2nd, 3rd, and/or 4th if also selected)
(X) = Maximum (for the 1 - 4 sensors selected)
(N) = Minimum (for the 1 - 4 sensors selected)

Example: Sensors 8, 9, 10, and 11 have been selected using the average mode.

Current Values: Displays the values of the sensors selected. The first one is the control value. *Example: 32^{O}F is the average of sensors 8, 9, 10. & 11, which have 30, 34, 32, & 32^{O}F respectively.*

On @: Refrigeration is turned on at this setpoint
Dly: after a delay of the number of seconds entered. (Temp. limits -50 to 270^{O}F; press. limits 0 - 499 psi; the "on delay" maximum is 120 seconds.) *Example: On at 34^{O}F after a delay of 60 seconds.*

Off @: Refrigeration is turned off at this setpoint after
Dly: a delay of the number of seconds entered. (Limits are the same as for the "On @" shown above.) *Example: Off at 28^{0}F after a delay of 5 seconds.*

Alarms: High ___ Low ___ Alarms occur at the setpoint entered within a range of -50^{0}F to 270^{0}F after
Dly: a delay within the range of 0 to 240 minutes. Note: The word "**ALARM**" intermittently blinks with the "**time**" in upper right of screen if an alarm is present. *Example: High alarm of 38^{0}F and low alarm of 25^{0}F after a delay of 60 minutes*

Notices: Similar to alarms except will not remotely alarm. *Example: High of 36^{0}F; Low of 27^{0}F with a 60 minute delay.*

5.5.4 Press 1 on the Main SENSOR CONTROL screen to observe the Status of the sensor control setpoints.

CPC #	-SENSOR STATUS- Name	Status	Value	CI	09:42 CO
8	Meat Case 1,2,3,4	Off	032	034	028
22	Meat Walk-In	On	033	032	029
18	Deli #1	On	036	038	034
4	Deli #2	Off	034	038	034
2	Dairy #3	On	035	036	033

^ = Prev Page | = Next Page 9 = Alm 0 = Menu

Five sensor control points will be displayed as shown in the above example. More can be viewed by pressing the arrows for Previous or next page.

5.5.5 Press 9 on the Sensor Status Menu to observe, acknowledge, or reset alarms and notices. Five alarms will be displayed per page for a total of 130. Date and time; "N" Notice or "A" Alarm; and Description will be displayed. Please read the section on alarms for more details

5.6 MAIN STATUS

5:6.1 From the Main Menu press 5 for the TRC STATUS.

```
CPC -TRC STATUS-                                          10:01
Suction: 12                                  VS: 1800 rpm 100%
V1   U2   C3   C4   5    6    7    8    9    10   S1   S2
ON   ON   ..   ..   ..   ..   ..   ..   ..   ..   ON   ..
Discharge- 018                                Grp2- 009
FAN  1    2    3    4    5    6    7    8    C1   C2   3
     ON   ON   ON   ON   ON   ON   ..   ..   ON   ..   ..

9 = Alm                                                0 = Menu
```

5.6.2 This screen reveals the type of units in Group One (not labeled Grp1 on screen) for units 1 through 10 shown on second line after heading; with C = Compressor, U = Unloader, V = Variable Speed, and nothing = no unit assigned. Group Two is labeled Grp2 and has up to 3 units; likewise these unit may be "C", "U", "V", or "nothing". S1 and S2 represent two satellite units. For these 10, 3, and 2 possible units (or unloaders) the status is shown as "ON" or ".." where the two dots represent "OFF".
5.6.3 The current suction pressure for Group 1 is shown on the first line after the heading beside "Suction:"; and for Group 2 it is shown beside "Grp2-".
5.6.4 The Discharge Pressure is shown as labeled.
5.6.5 If a pressure transducer is not electrically connected to it's input the letters "OPN" will appear instead of a pressure value.
5.6.6 The status of up to 8 condensers fans is shown on the last line as "ON" or ".." for OFF.
5.6.7 Press 9 for any alarms and 0 to return to the main menu.

5.7 LOGS

(See Paragraph 5.2.12 for Pressure Logs.)

5.8 CONFIGURATION

5.8.1 From the Main Menu press 7 to enter into the CONFIGURATION menu.

```
CPC -CONFIGURATION-                                       10:29

        1-Input Definition                  4-Communications
        2-Output Definitions                5-Xducer Offsets
        3-System Information                6-Network Menu


Make Selection                                          0=Main
```

5.8.2 From the CONFIGURATION Menu the Inputs may be defined as to which 16AI Board number (1-20) and which input number (1-16) on that board by pressing 1.

CPC -INPUT DEFINITIONS 10:33

Input	Bd	Pt	Input	Bd	Pt
SUCT PRESS	00	00	DSCH PRESS	00	00
SAT1 P/T	00	00	SAT2 P/T	00	00
DEFR INHIB	00	00	SUCT TEMP	00	00
DSCH TEMP	00	00	CASE1 TEMP	00	00

^ =Prev Page | =Next Page 9=Alm 0=Menu

5.8.3 With the INPUT DEFINITION screen on display press the right arrow to move the cursor to each "Bd" and "Pt". After moving the cursor to the first "Bd" the other arrows may be used to move around on the screen. You will note at the bottom of the screen the range for boards is 1-20; and the range for points is 1-16. Once the first screen has been defined and the cursor is off the screen the next page may be viewed for other inputs by pressing the down arrow for "Next Page". Likewise, the up arrow is used for the previous page. There are 16 pages covering all of the inputs.

5.8.4 Press 9 to view a log of the alarms. To return to the CONFIGURATION Menu press 0.

5.8.5 From the CONFIGURATION screen press 2 for the OUTPUT DEFINITIONS Menu.

CPC -OUTPUT DEFINITIONS 10:47

Output	Bd	Pt	Output	Bd	Pt
COMP #01	00	00	COMP #02	00	00
COMP #03	00	00	COMP #04	00	00
COMP #05	00	00	COMP #06	00	00
SAT #1	00	00	ALARM	00	00

^ =Prev Page | =Next Page 9=Alm 0=Menu

5.8.6 From the OUTPUT DEFINITIONS Screen The right arrow will move the cursor to the first "Bd", then to the first "Pt". After the cursor is on the screen all arrows may be used to move about on the screen. Boards have a range of 1-20 and points on the 8RO board have a range of 1-8. After the outputs are defined for that screen and the cursor is off the screen, the down arrow can be used to move to the next page of outputs. To return to the CONFIGURATION Menu press 0.

5.8.7 From the CONFIGURATION screen press 3 for SYSTEM INFORMATION.

```
CPC  -SYSTEM INFORMATION                                        10:58

Unit Name: CPC'S TOTAL RACK CONTROL
Date: 08/17/89          Time: 10:58                    Day: THU
Passwords:      #1:  100              #3:  300
                #2:  200              #4:  400
Software Revision A:08

^ =Prev Page | =Next Page          9=Alm                  0=Menu
```

5.8.8 The SYSTEM INFORMATION Menu screen allows one to name the rack; set the date, time, and day; change passwords; and review the software version on page one. On page two the Phone Number #1 and #2 may be entered. These are used for dial out when the modem and communications option are used. Also, on page two the beginning and ending dates for daylight savings can be entered. Use the right arrow to move the cursor on to the first information to be entered, then all arrows to move about on the screen. To return to the CONFIGURATION Menu press 0.

5.8.9 Press 4 from the CONFIGURATION Menu to bring COMMUNICATIONS to the screen.

```
CPC  -COMMUNICATIONS SETUP-                                     11:18

Unit #: 01
Primary RS-232  Port Protocol:
     Baud: 1200        Parity:    N     Data Bits:    8
Secondary RS-232 Port Protocol:
     Baud: 2400        Parity:    E     Data Bits:    7

^ =MENU   9=Alm                                          0=Menu
```

Set baud rate, parity, and data bits to match the modem. Press the up arrow to return to the CONFIGURATION menu. Make sure switches on TRC door match this baud rate.

5.8.10 TRANSDUCER OFFSETS Press 5 from the CONFIGURATION Menu to bring TRANSDUCER OFFSETS to the screen.

```
CPC  -TRANSDUCER OFFSETS-                                    11:25
Main Suction      :00.0                  Discharge    :     000
Group 2 Suction   :00.0
                          1     2     3     4     5     6
Oil                       000   000   000   000   000   000
Press.                7   8     9     10    11    12    13
                      000 000   000   000   000   000   000

^ =MENU   9=Alm                                              0=Menu
```

Set the transducer offsets to match that listed on the transducer. Press the up arrow to return to the CONFIGURATION menu.

5.8.11 NETWORK MENU Press 6 from the CONFIGURATION Menu to bring NETWORK MENU to the screen.

```
-NETWORK (ECN) MENU-                                         11:30
1. Status                          6. Set Delays
2. Msg. Status                     7. Set Device #'s
3. Device Status                   8. Send Message
4. Reset ECN
5. ONLINE Status
```

In general, this menu is mostly used by qualified CPC factory service engineers and should not be used by the user unless requested to do so by the factory engineer; however, there are three menu items which should be checked and set by the user. These are as follows:

4. Reset ECN - ECN stands for Expansion Communication Network. Press 4 from the NETWORK MENU to bring this up on the screen.

```
                                                             11:31
1) Network  OFF          2) Reset Network    (ON)
```

Press 2 to make sure the ECN is ON. The words "Reset Network (ON)" will appear on a second line on the screen. Press ENT to return to the NETWORK MENU.

6. Set Delays - These are preset at the factory but should be checked and set for the default values by the user. Press 6 to bring up the SET DELAYS screen.

```
                                                        11:32

ECN msg. timeout                    3:
```

Press 3, the default, and press ENT to set this at 3. (1/10 of a second per unit) The screen will change to prompt for the next item and the next etc.

```
                                                        11:33

ECN msg. timeout                    3:      3
Pass token timeout                  700:    7OO
Transmit delay                      0:      0
Break duration                      6:      6
```

Enter the defaults one at a time as shown above by entering the value then press ENT after each is entered. After entering 6 for "break duration" the screen will return to NETWORK MENU.

7. Set Device #'s - Press 7 and follow the prompts on the screen for setting the device number for each board connected to the TRC via the RS485 communication network. This is to be set for each 8RO board, 16AI board, Variable Speed board, and 485 alarm (option) on the network.

These are the only menu items you will need to set from the NETWORK MENU.

Press the up arrow, or ENT, to return to the CONFIGURATION menu. Press 0 to return to the MAIN MENU.

5.9 GRAPHS

5.9.1 From the MAIN MENU press 8 for GRAPHS. The screen will display as follows:

```
CPC  -GRAPHS-                                           11:42

1. Grp 1 Suction                    5. Comp. Runtimes
2. Grp 2 Suction                    6. Fan Runtimes
3. Discharge                        7. Satellites
4. Case Temps                       8. Sensors

Make Selection                                          0=Main
```

5.9.2 Press 1 to see a graph of either temperature or pressure for the Group 1 compressor system. You will see a chart of pressure in psig (or temperature in degrees F.) vs time in intervals (last 55 intervals). The minimum (mn) and maximum (mx) pressure are stated on the screen. The interval is as defined under the PRESSURE CONTROL menu item 3 Alarms and shown as Logging Interval. This interval once set is used for all categories of logging and for the suction pressure and temperature graphs.

By depressing the left arrow one can observe the last part of the graph in more detail. Press any key to get back to the GRAPHS menu.

5.9.3 Press 2 to see a the same type graphs for the Group 1 compressor system.

5.9.4 Press 5 for a bar graph of runtimes for the compressors (1 through up to 13). The runtimes are in hours. A number is shown on the X axis representing the compressor's assigned number. An X is shown for unassigned positions.

5.9.5 Press 6 to see a graph of runtimes for the condenser fans. This chart is similar to the compressor runtimes. Up to 8 fans can be assigned and therefore charted. Other data may be viewed for satellites, case temps, and sensors.

5.10 ALARMS

5.10.1 If necessary re-enter the system by logging on the password as shown in Section 4.6 paragraph 4.6.1.

5.10.2 Press 9 from MAIN MENU. A display of the last 5 of 129 alarms showing date, time, whether an alarm or notice, and the description will be displayed. Press up or down arrows to view more. Press 7 to acknowledge. Press 9 to reset. Press 0 to return to main menu.

APPENDIX A

FINE TUNING THE PRESSURE CONTROL FOR VARIABLE SPEED COMPRESSORS

A.1 INTRODUCTION. The control of the suction pressure on a variable speed compressor rack is greatly enhanced by the logic programmed into the TRC'S software. CPC has incorporated a control logic using feedback control called "PID Control". To take advantage of this enhancement it will be necessary to fine tune the PID setpoints.

A.2 PID CONTROL. PID is the acronym for Proportional-Integral-Derivative. The TRC uses feedback control. In other words, to control it subtracts the current actual suction pressure from the setpoint to obtain the "error". This "error" is then multiplied by the three constants (P, I, and D) to control compressor speed. When the "P" (Proportional) constant is just right the multiplication of it times the "error" will change the speed to hit the setpoint target without constantly going over target or under target. This will then tend to minimize too much oscillating. The "P" constant feedback signal is in proportion to the size of the "error". If the "P" constant seems to require changing see paragraph A.3 below.

The "I" (Integral) constant is the sum of the "error" over a given period of time. Like the "P" constant, it's feedback signal is proportional to the size of the "error"; except it integrates the "error" size over a period of time. When the "I" constant is just right the suction pressure will tend to remain consistently at setpoint. If it tends to remain consistently above or below setpoint, perhaps it needs to be changed as described in paragraph A.4 below.

The "D" (Derivative) constant looks at the rate of change of the suction pressure. It's feedback signal is proportional to the size of the rate of change. If the suction pressure takes a sudden large jump the "I" constants feedback signal would be large and; therefore, when multiplied by the "I" constant it would cause the speed of the variable speed compressor much faster to reach set point faster. If the suction pressure has a small change, then the feedback signal is small causing a small change in speed to approach setpoint. If the suction pressure is not changing the "D" feedback signal is zero because the rate of change is zero. Refer to paragraph A.5 for information about changing the "D" constant.

A.3 CHANGING THE "P" CONSTANT. For variable speed applications using a Variable Speed Board a "P" constant having a value of 10 is normal. To enter this value go to the main menu and press "1" (Pressure Control), then from the PRESSURE MENU screen press 2 for setpoints. Press the down arrow three times to get to the fourth page. The screen will be as follows:

APPENDIX B

FLOW DIAGRAM FOR ALL MENUS

A.1 INTRODUCTION.The following drawings depict the screens for all applications leading from the Main Menu. Fig. B-1 depicts the choices one may select from the Main Menu. Each of these choices are then detailed beginning with Fig. B-2 "PRESSURE CONTROL DIAGRAM".

A-2 CHANGING PAGES. To change from the first page of each menu press the down arrow. Continue pressing the down arrow for additional pages or the up arrow to return back to pages.

A-3 ENTERING DATA. With the screen on SETPOINTS, SETUP, or BYPASS types the data may be changed or entered by pressing the right arrow to the item to be changed. Look at the lower prompt bar to see the choices or values permitted. Once in the field one may use the left, up, and down arrow to speed up the process of getting to the item to be changed or entered

A-4 THE PROMPT BAR. A useful tool in the TRC software is the lower prompt bar on each screen. Observe this to know the next step and to see information about entering data values and choices.

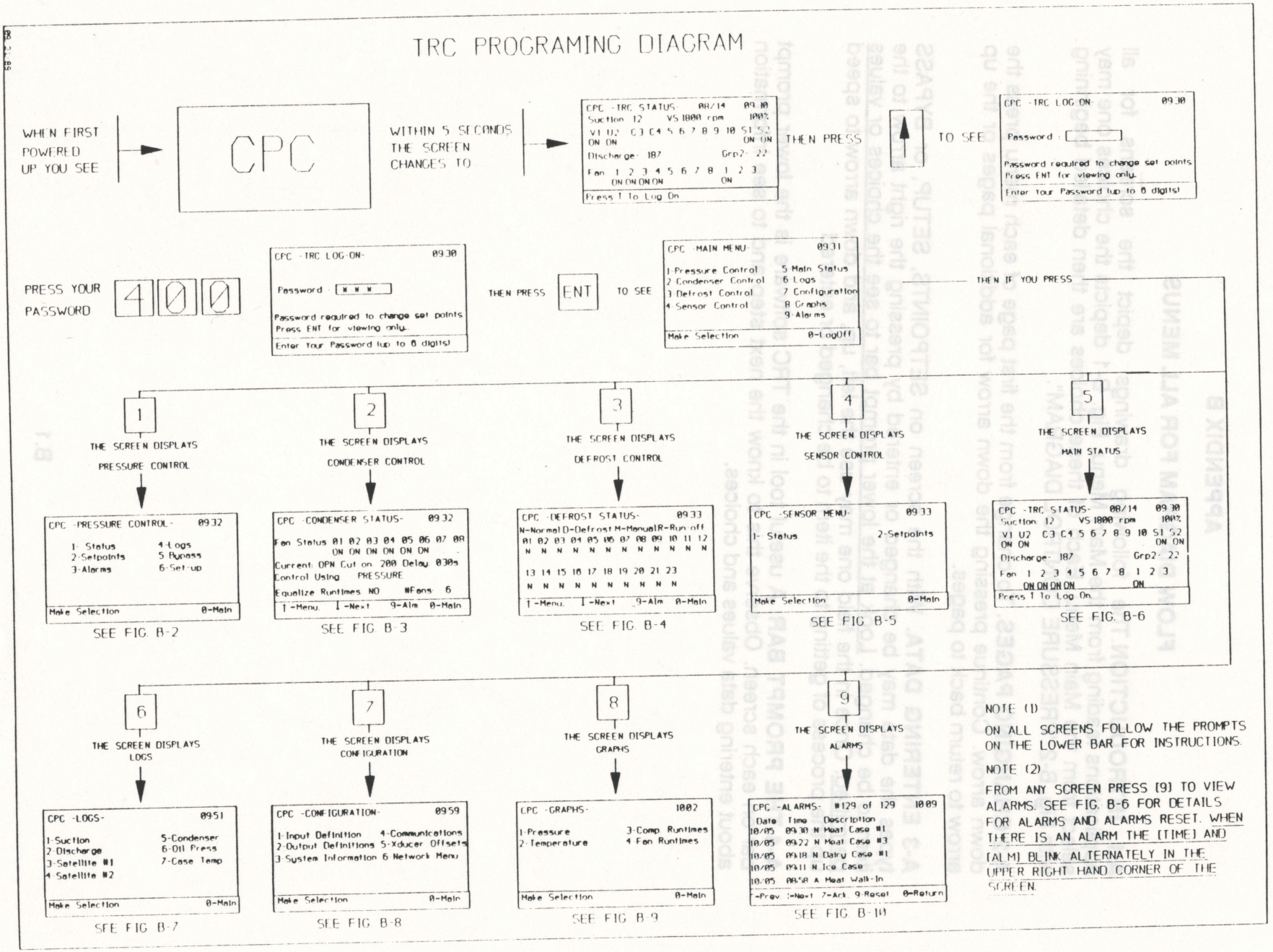
TRC PROGRAMING DIAGRAM
WHEN FIRST POWERED UP YOU SEE
CPC
WITHIN 5 SECONDS THE SCREEN CHANGES TO
CPC -TRC STATUS- 08/14 09:30
Suction 12 VS 1800 rpm 100%
V1 V2 C3 C4 5 6 7 8 9 10 S1 S2
ON ON ON ON
Discharge- 187 Grp2- 22
Fan 1 2 3 4 5 6 7 8 1 2 3
ON ON ON ON ON
Press 1 To Log On
THEN PRESS
TO SEE
CPC -TRC LOG-ON- 09:30
Password :
Password required to change set points
Press ENT for viewing only.
Enter Your Password (up to 6 digits)
PRESS YOUR PASSWORD 4 0 0
CPC -TRC LOG-ON- 09:30
Password : * * *
Password required to change set points
Press ENT for viewing only.
Enter Your Password (up to 6 digits)
THEN PRESS ENT
TO SEE
CPC -MAIN MENU- 09:31
1-Pressure Control
2-Condenser Control
3-Defrost Control
4-Sensor Control
5-Main Status
6-Logs
7-Configuration
8-Graphs
9-Alarms
Make Selection 0-LogOff
THEN IF YOU PRESS
1
THE SCREEN DISPLAYS PRESSURE CONTROL
CPC -PRESSURE CONTROL- 09:32
1- Status 4-Logs
2-Setpoints 5-Bypass
3-Alarms 6-Set-up
Make Selection 0-Main
SEE FIG. B-2
2
THE SCREEN DISPLAYS CONDENSER CONTROL
CPC -CONDENSER STATUS- 09:32
Fan Status 01 02 03 04 05 06 07 08
ON ON ON ON ON ON
Current: OPN Cut on: 200 Delay: 030s
Control Using: PRESSURE
Equalize Runtimes: NO #Fans: 6
1-Menu. I-Next 9-Alm 0-Main
SEE FIG. B-3
3
THE SCREEN DISPLAYS DEFROST CONTROL
CPC -DEFROST STATUS- 09:33
N-Normal D-Defrost M-Manual R-Run-off
01 02 03 04 05 06 07 08 09 10 11 12
N N N N N N N N N N N N
13 14 15 16 17 18 19 20 21 23
N N N N N N N N N N
1-Menu. I-Next 9-Alm 0-Main
SEE FIG. B-4
4
THE SCREEN DISPLAYS SENSOR CONTROL
CPC -SENSOR MENU- 09:33
1- Status 2-Setpoints
Make Selection 0-Main
SEE FIG. B-5
5
THE SCREEN DISPLAYS MAIN STATUS
CPC -TRC STATUS- 08/14 09:30
Suction 12 VS 1800 rpm 100%
V1 V2 C3 C4 5 6 7 8 9 10 S1 S2
ON ON ON ON
Discharge- 187 Grp2- 22
Fan 1 2 3 4 5 6 7 8 1 2 3
ON ON ON ON ON
Press 1 To Log On
SEE FIG. B-6
6
THE SCREEN DISPLAYS LOGS
CPC -LOGS- 09:51
1-Suction 5-Condenser
2-Discharge 6-Oil Press
3-Satellite #1 7-Case Temp
4-Satellite #2
Make Selection 0-Main
SEE FIG. B-7
7
THE SCREEN DISPLAYS CONFIGURATION
CPC -CONFIGURATION- 09:59
1-Input Definition 4-Communications
2-Output Definitions 5-Xducer Offsets
3-System Information 6-Network Menu
Make Selection 0-Main
SEE FIG. B-8
8
THE SCREEN DISPLAYS GRAPHS
CPC -GRAPHS- 10:02
1-Pressure 3-Comp Runtimes
2-Temperature 4-Fan Runtimes
Make Selection 0-Main
SEE FIG. B-9
9
THE SCREEN DISPLAYS ALARMS
CPC -ALARMS- #129 of 129 10:09
Date Time Description
10/05 09:30 N Meat Case #1
10/05 09:22 N Meat Case #3
10/05 09:18 N Dairy Case #1
10/05 09:11 N Ice Case
10/05 08:58 A Meat Walk-In
-Prev. =Next 7-Ack. 9-Reset 0-Return
SEE FIG. B-10
NOTE (1)
ON ALL SCREENS FOLLOW THE PROMPTS ON THE LOWER BAR FOR INSTRUCTIONS.
NOTE (2)
FROM ANY SCREEN PRESS [9] TO VIEW ALARMS. SEE FIG. B-6 FOR DETAILS FOR ALARMS AND ALARMS RESET. WHEN THERE IS AN ALARM THE [TIME] AND [ALM] BLINK ALTERNATELY IN THE UPPER RIGHT HAND CORNER OF THE SCREEN.

Fig. B-1
Main Menu Diagram

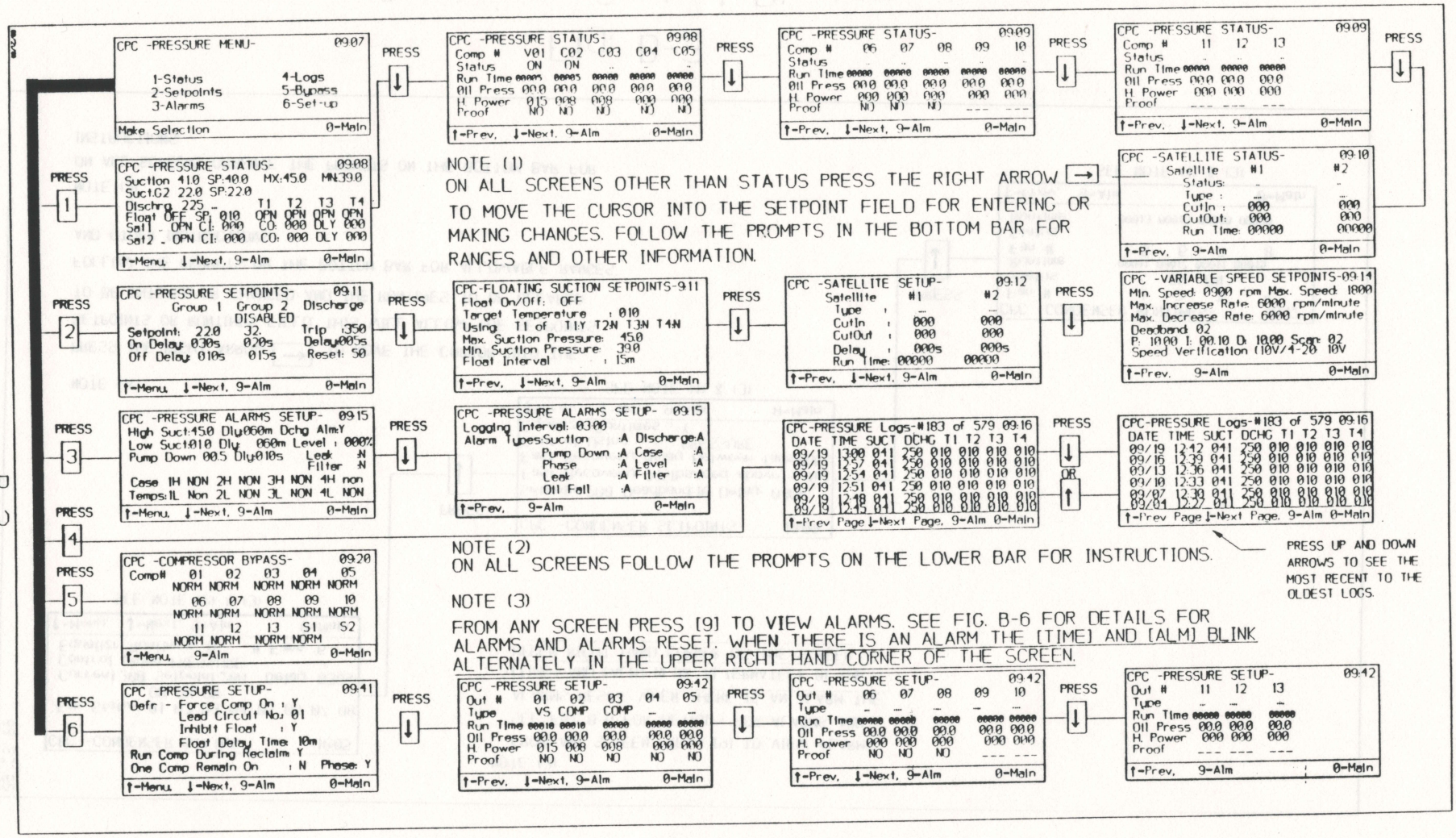
CPC -PRESSURE MENU- 09:07
1-Status 4-Logs
2-Setpoints 5-Bypass
3-Alarms 6-Set-up
Make Selection 0-Main
PRESS
CPC -PRESSURE STATUS- 09:08
Comp # V01 C02 C03 C04 C05
Status ON ON
Run Time
Oil Press 000 000 000 000 000
H Power 015 008 008 000 000
Proof NO NO NO NO NO
↑-Prev, ↓-Next, 9-Alm 0-Main
PRESS
CPC -PRESSURE STATUS- 09:09
Comp # 06 07 08 09 10
Status
Run Time
Oil Press 000 000 000 000 000
H Power 000 000 000 000 000
Proof NO NO NO
↑-Prev, ↓-Next, 9-Alm 0-Main
PRESS
CPC -PRESSURE STATUS- 09:09
Comp # 11 12 13
Status
Run Time
Oil Press 000 000 000
H Power 000 000 000
Proof
↑-Prev, ↓-Next, 9-Alm 0-Main
PRESS
1
CPC -PRESSURE STATUS- 09:08
Suction 410 SP:400 MX:450 MN:390
Suct G2 220 SP:220
Dischrg 225 T1 T2 T3 T4
Float OFF SP: 010 OPN OPN OPN OPN
Sail - OPN C1: 000 C0: 000 DLY 000
Sa12 - OPN C1: 000 C0: 000 DLY 000
↑-Menu, ↓-Next, 9-Alm 0-Main
NOTE (1)
ON ALL SCREENS OTHER THAN STATUS PRESS THE RIGHT ARROW →
TO MOVE THE CURSOR INTO THE SETPOINT FIELD FOR ENTERING OR MAKING CHANGES. FOLLOW THE PROMPTS IN THE BOTTOM BAR FOR RANGES AND OTHER INFORMATION.
CPC -SATELLITE STATUS- 09:10
Satellite #1 #2
Status:
Type :
CutIn : 000 000
CutOut: 000 000
Run Time: 00000 00000
↑-Prev, 9-Alm 0-Main
PRESS
2
CPC -PRESSURE SETPOINTS- 09:11
Group 1 Group 2 Discharge
DISABLED
Setpoint: 220 32. Trip :350
On Delay: 030s 020s Delay:005s
Off Delay: 010s 015s Reset: 50
↑-Menu, ↓-Next, 9-Alm 0-Main
PRESS
CPC-FLOATING SUCTION SETPOINTS-9:11
Float On/Off: OFF
Target Temperature : 010
Using: T1 of T1:Y T2:N T3:N T4:N
Max. Suction Pressure: 450
Min. Suction Pressure: 390
Float Interval : 15m
↑-Prev, ↓-Next, 9-Alm 0-Main
PRESS
CPC -SATELLITE SETUP- 09:12
Satellite #1 #2
Type
CutIn : 000 000
CutOut : 000 000
Delay : 000s 000s
Run Time: 00000 00000
↑-Prev, ↓-Next, 9-Alm 0-Main
PRESS
CPC -VARIABLE SPEED SETPOINTS-09:14
Min. Speed: 0900 rpm Max. Speed: 1800
Max. Increase Rate: 6000 rpm/minute
Max. Decrease Rate: 6000 rpm/minute
Deadband: 02
P: 10.00 I: 00.10 D: 10.00 Scan: 02
Speed Verification (10V/4-20 10V
↑-Prev, 9-Alm 0-Main
PRESS
3
CPC -PRESSURE ALARMS SETUP- 09:15
High Suct:450 Dly:060m Dchg Alm:Y
Low Suct:010 Dly: 060m Level : 000%
Pump Down 005 Dly:010s Leak :N
Filter :N
Case 1H NON 2H NON 3H NON 4H non
Temps:1L Non 2L NON 3L NON 4L NON
↑-Menu, ↓-Next, 9-Alm 0-Main
PRESS
CPC -PRESSURE ALARMS SETUP- 09:15
Logging Interval: 03:00
Alarm Types:Suction :A Discharge:A
Pump Down :A Case :A
Phase :A Level :A
Leak :A Filter :A
Oil Fail :A
↑-Prev, 9-Alm 0-Main
PRESS
CPC-PRESSURE Logs-#183 of 579 09:16
DATE TIME SUCT DCHG T1 T2 T3 T4
09/19 13:00 041 250 010 010 010 010
09/19 12:57 041 250 010 010 010 010
09/19 12:54 041 250 010 010 010 010
09/19 12:51 041 250 010 010 010 010
09/19 12:48 041 250 010 010 010 010
09/19 12:45 041 250 010 010 010 010
↑-Prev Page ↓-Next Page, 9-Alm 0-Main
PRESS
OR
CPC-PRESSURE Logs-#183 of 579 09:16
DATE TIME SUCT DCHG T1 T2 T3 T4
09/19 12:42 041 250 010 010 010 010
09/16 12:39 041 250 010 010 010 010
09/13 12:36 041 250 010 010 010 010
09/10 12:33 041 250 010 010 010 010
09/07 12:30 041 250 010 010 010 010
09/01 12:27 041 250 010 010 010 010
↑-Prev Page ↓-Next Page, 9-Alm 0-Main
PRESS UP AND DOWN ARROWS TO SEE THE MOST RECENT TO THE OLDEST LOGS.
PRESS
4
NOTE (2)
ON ALL SCREENS FOLLOW THE PROMPTS ON THE LOWER BAR FOR INSTRUCTIONS.
PRESS
5
CPC -COMPRESSOR BYPASS- 09:20
Comp# 01 02 03 04 05
NORM NORM NORM NORM NORM
06 07 08 09 10
NORM NORM NORM NORM NORM
11 12 13 S1 S2
NORM NORM NORM NORM
↑-Menu, 9-Alm 0-Main
NOTE (3)
FROM ANY SCREEN PRESS [9] TO VIEW ALARMS. SEE FIG. B-6 FOR DETAILS FOR ALARMS AND ALARMS RESET. WHEN THERE IS AN ALARM THE [TIME] AND [ALM] BLINK ALTERNATELY IN THE UPPER RIGHT HAND CORNER OF THE SCREEN.
PRESS
6
CPC -PRESSURE SETUP- 09:41
Defr - Force Comp On : Y
Lead Circuit No: 01
Inhibit Float : Y
Float Delay Time: 10m
Run Comp During Reclaim Y
One Comp Remain On : N Phase: Y
↑-Menu, ↓-Next, 9-Alm 0-Main
PRESS
CPC -PRESSURE SETUP- 09:42
Out # 01 02 03 04 05
Type VS COMP COMP
Run Time
Oil Press 000 000 000 000 000
H Power 015 008 008 000 000
Proof NO NO NO NO NO
↑-Prev, ↓-Next, 9-Alm 0-Main
PRESS
CPC -PRESSURE SETUP- 09:42
Out # 06 07 08 09 10
Type
Run Time
Oil Press 000 000 000 000 000
H Power 000 000 000 000 000
Proof NO NO NO
↑-Prev, ↓-Next, 9-Alm 0-Main
PRESS
CPC -PRESSURE SETUP- 09:42
Out # 11 12 13
Type
Run Time
Oil Press 000 000 000
H Power 000 000 000
Proof
↑-Prev, 9-Alm 0-Main

Fig. B-2
Pressure Control Diagram

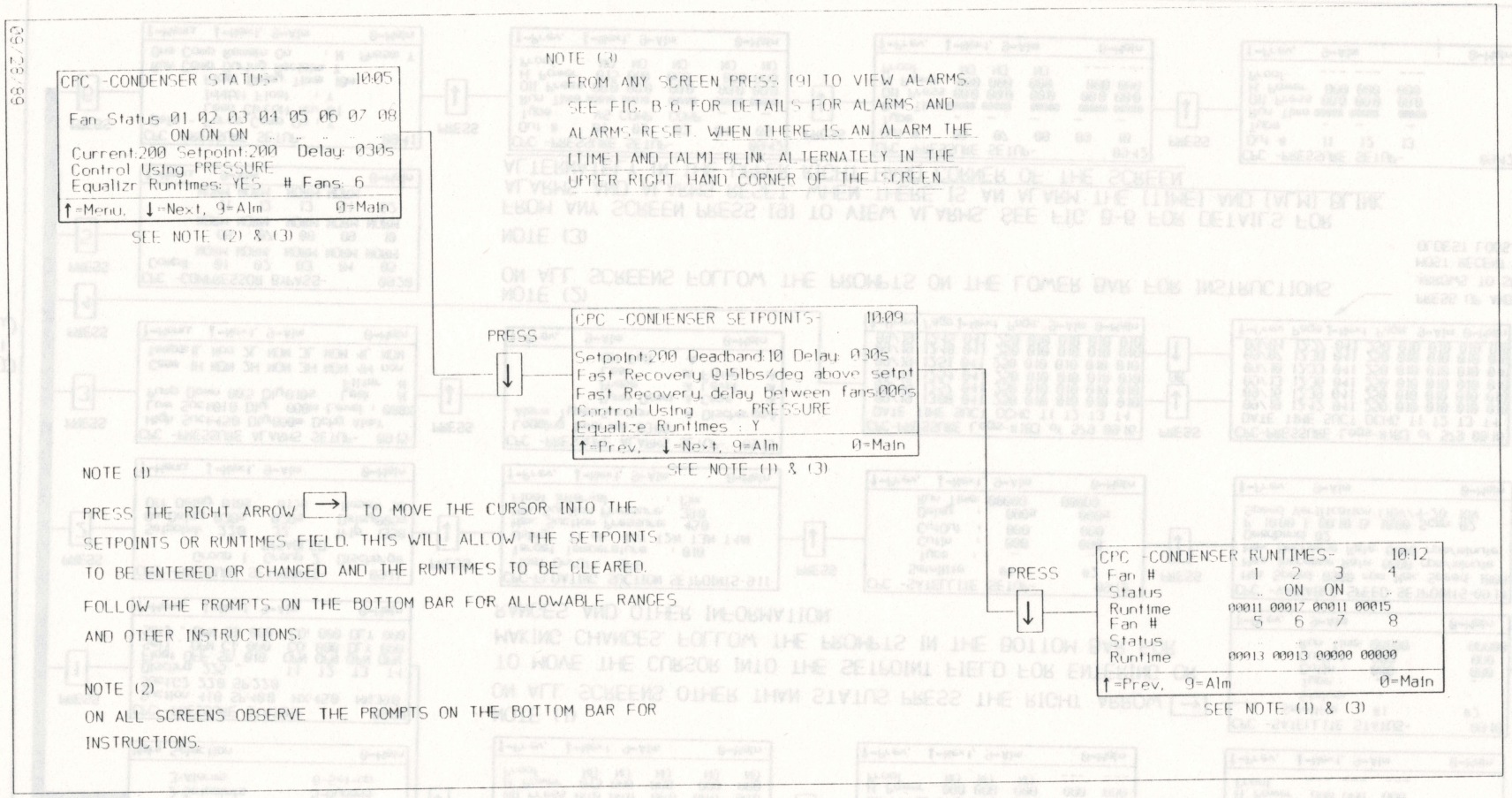
CPC -CONDENSER STATUS- 10:05
Fan Status 01 02 03 04 05 06 07 08
ON ON ON
Current:200 Setpoint:200 Delay: 030s
Control Using PRESSURE
Equalizr Runtimes: YES # Fans: 6
↑=Menu, ↓=Next, 9=Alm 0=Main
SEE NOTE (2) & (3)
NOTE (3)
FROM ANY SCREEN PRESS [9] TO VIEW ALARMS.
SEE FIG. B-6 FOR DETAILS FOR ALARMS AND
ALARMS RESET. WHEN THERE IS AN ALARM THE
[TIME] AND [ALM] BLINK ALTERNATELY IN THE
UPPER RIGHT HAND CORNER OF THE SCREEN.
PRESS
↓
CPC -CONDENSER SETPOINTS- 10:09
Setpoint:200 Deadband:10 Delay: 030s
Fast Recovery @15lbs/deg above setpt
Fast Recovery delay between fans:006s
Control Using : PRESSURE
Equalize Runtimes : Y
↑=Prev, ↓=Next, 9=Alm 0=Main
SEE NOTE (1) & (3)
NOTE (1)
PRESS THE RIGHT ARROW → TO MOVE THE CURSOR INTO THE
SETPOINTS OR RUNTIMES FIELD. THIS WILL ALLOW THE SETPOINTS
TO BE ENTERED OR CHANGED AND THE RUNTIMES TO BE CLEARED.
FOLLOW THE PROMPTS ON THE BOTTOM BAR FOR ALLOWABLE RANGES
AND OTHER INSTRUCTIONS.
NOTE (2)
ON ALL SCREENS OBSERVE THE PROMPTS ON THE BOTTOM BAR FOR
INSTRUCTIONS.
PRESS
↓
CPC -CONDENSER RUNTIMES- 10:12
Fan # 1 2 3 4
Status ON ON
Runtime 00011 00017 00011 00015
Fan # 5 6 7 8
Status
Runtime 00013 00013 00000 00000
↑=Prev, 9=Alm 0=Main
SEE NOTE (1) & (3)

Fig. B-3

Condenser Control Diagram

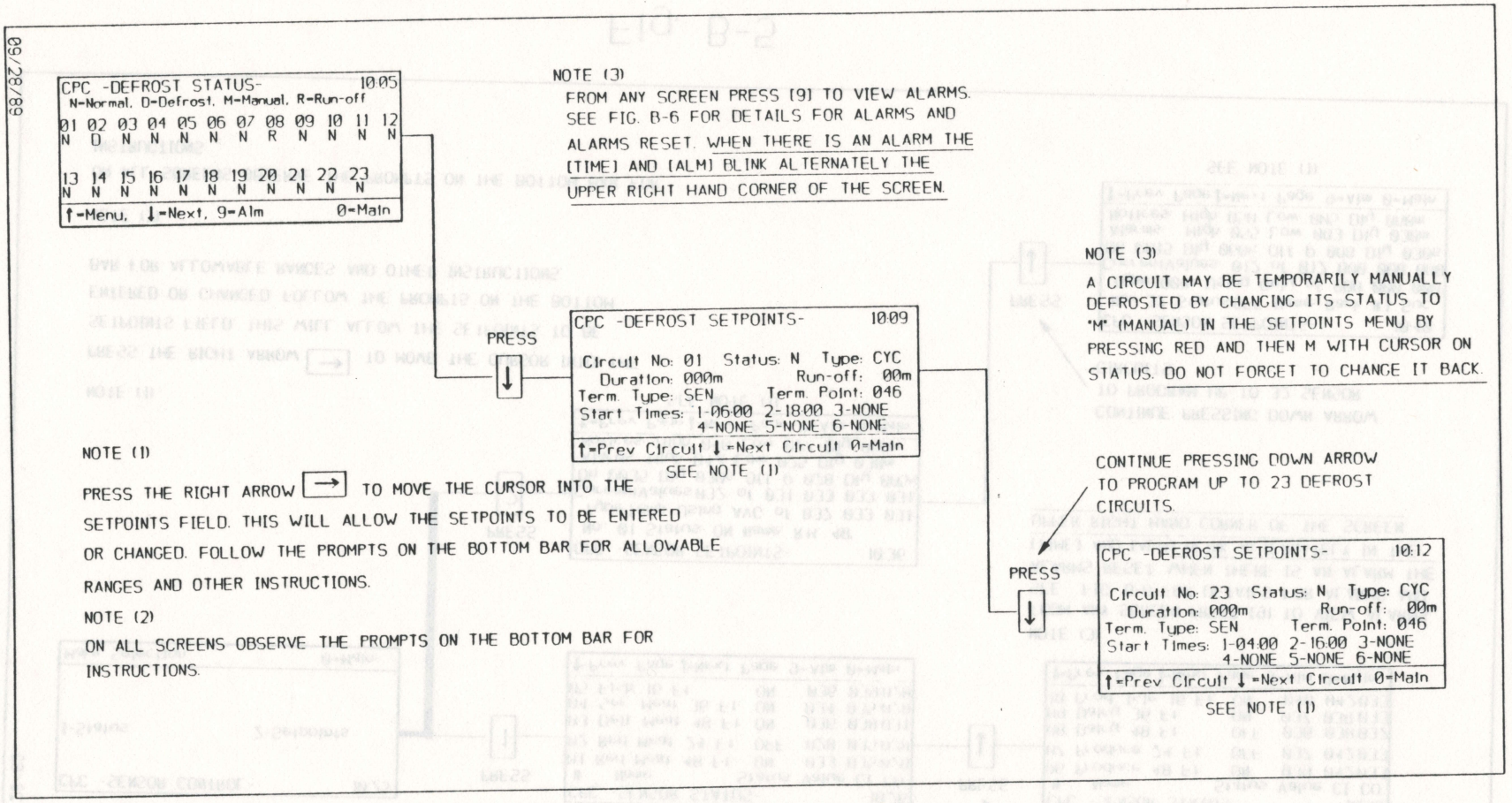
09/28/89
CPC -DEFROST STATUS- 10:05
N-Normal, D-Defrost, M-Manual, R-Run-off
01 02 03 04 05 06 07 08 09 10 11 12
N D N N N N N R N N N N
13 14 15 16 17 18 19 20 21 22 23
N N N N N N N N N N N
↑-Menu, ↓-Next, 9-Alm 0-Main
NOTE (3)
FROM ANY SCREEN PRESS [9] TO VIEW ALARMS.
SEE FIG. B-6 FOR DETAILS FOR ALARMS AND
ALARMS RESET. WHEN THERE IS AN ALARM THE
[TIME] AND [ALM] BLINK ALTERNATELY THE
UPPER RIGHT HAND CORNER OF THE SCREEN.
PRESS
CPC -DEFROST SETPOINTS- 10:09
Circuit No: 01 Status: N Type: CYC
Duration: 000m Run-off: 00m
Term. Type: SEN Term. Point: 046
Start Times: 1-06:00 2-18:00 3-NONE
4-NONE 5-NONE 6-NONE
↑-Prev Circuit ↓-Next Circuit 0-Main
SEE NOTE (1)
NOTE (3)
A CIRCUIT MAY BE TEMPORARILY MANUALLY
DEFROSTED BY CHANGING ITS STATUS TO
"M" (MANUAL) IN THE SETPOINTS MENU BY
PRESSING RED AND THEN M WITH CURSOR ON
STATUS. DO NOT FORGET TO CHANGE IT BACK.
NOTE (1)
PRESS THE RIGHT ARROW → TO MOVE THE CURSOR INTO THE
SETPOINTS FIELD. THIS WILL ALLOW THE SETPOINTS TO BE ENTERED
OR CHANGED. FOLLOW THE PROMPTS ON THE BOTTOM BAR FOR ALLOWABLE
RANGES AND OTHER INSTRUCTIONS.
NOTE (2)
ON ALL SCREENS OBSERVE THE PROMPTS ON THE BOTTOM BAR FOR
INSTRUCTIONS.
CONTINUE PRESSING DOWN ARROW
TO PROGRAM UP TO 23 DEFROST
CIRCUITS.
PRESS
CPC -DEFROST SETPOINTS- 10:12
Circuit No: 23 Status: N Type: CYC
Duration: 000m Run-off: 00m
Term. Type: SEN Term. Point: 046
Start Times: 1-04:00 2-16:00 3-NONE
4-NONE 5-NONE 6-NONE
↑-Prev Circuit ↓-Next Circuit 0-Main
SEE NOTE (1)

Fig. B-4

Defrost Control Diagram

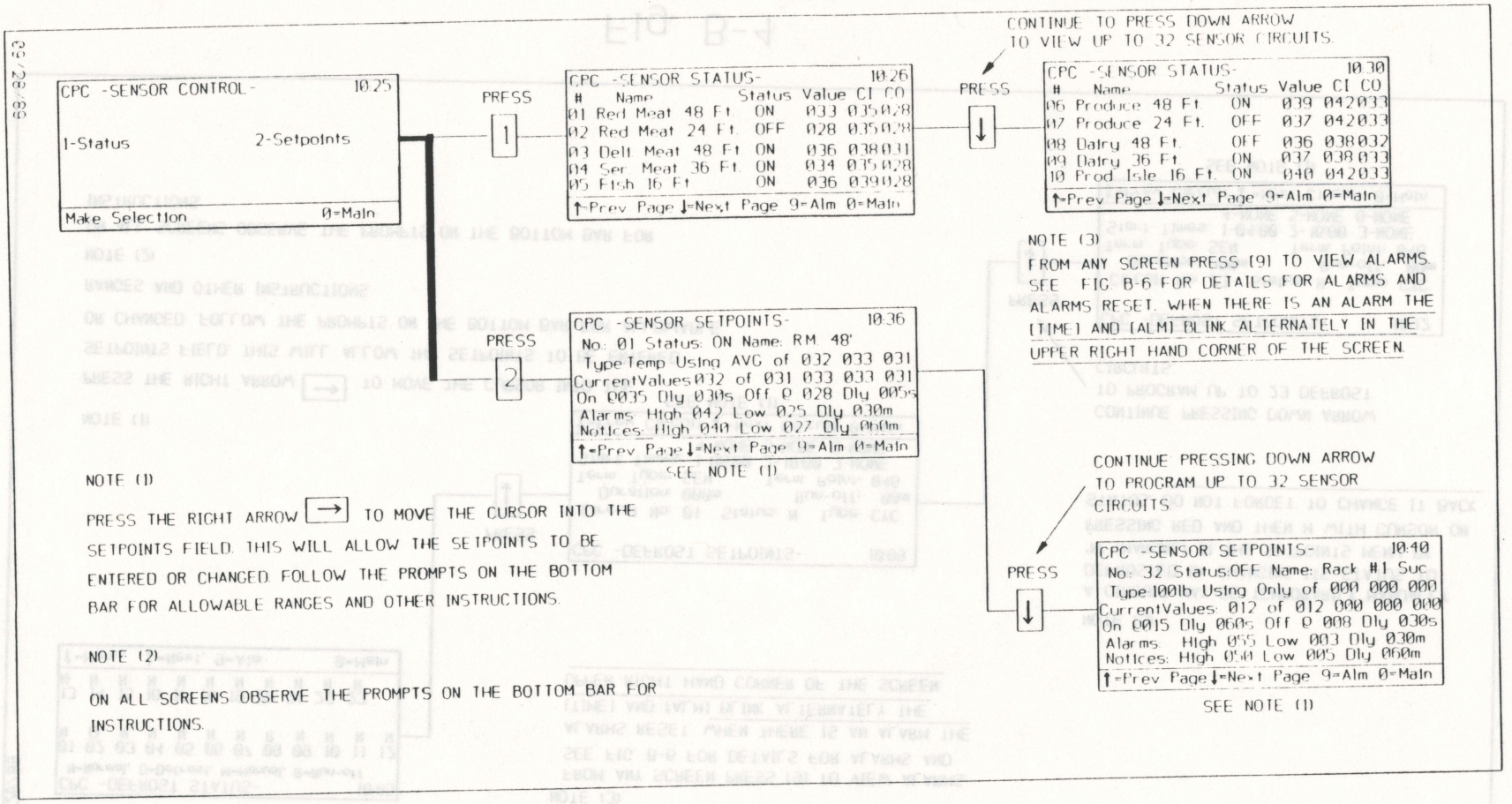
CPC -SENSOR CONTROL- 10:25
1-Status 2-Setpoints
Make Selection 0=Main
PRESS
1
CPC -SENSOR STATUS- 10:26
Name Status Value CI CO
01 Red Meat 48 Ft. ON 033 035 028
02 Red Meat 24 Ft. OFF 028 035 028
03 Dell Meat 48 Ft. ON 036 038 031
04 Ser. Meat 36 Ft. ON 034 035 028
05 Fish 16 Ft ON 036 039 028
↑=Prev Page ↓=Next Page 9=Alm 0=Main
CONTINUE TO PRESS DOWN ARROW
TO VIEW UP TO 32 SENSOR CIRCUITS.
PRESS
↓
CPC -SENSOR STATUS- 10:30
Name Status Value CI CO
06 Produce 48 Ft. ON 039 042 033
07 Produce 24 Ft. OFF 037 042 033
08 Dairy 48 Ft. OFF 036 038 032
09 Dairy 36 Ft. ON 037 038 033
10 Prod. Isle 16 Ft. ON 040 042 033
↑=Prev Page ↓=Next Page 9=Alm 0=Main
NOTE (3)
FROM ANY SCREEN PRESS [9] TO VIEW ALARMS.
SEE FIG. B-6 FOR DETAILS FOR ALARMS AND
ALARMS RESET. WHEN THERE IS AN ALARM THE
[TIME] AND [ALM] BLINK ALTERNATELY IN THE
UPPER RIGHT HAND CORNER OF THE SCREEN.
PRESS
2
CPC -SENSOR SETPOINTS- 10:36
No: 01 Status: ON Name: RM 48'
Type:Temp Using AVG of 032 033 031
CurrentValues:032 of 031 033 033 031
On 0035 Dly 030s Off 0 028 Dly 005s
Alarms: High 042 Low 025 Dly 030m
Notices: High 040 Low 027 Dly 060m
↑=Prev Page ↓=Next Page 9=Alm 0=Main
SEE NOTE (1)
NOTE (1)
PRESS THE RIGHT ARROW → TO MOVE THE CURSOR INTO THE
SETPOINTS FIELD. THIS WILL ALLOW THE SETPOINTS TO BE
ENTERED OR CHANGED. FOLLOW THE PROMPTS ON THE BOTTOM
BAR FOR ALLOWABLE RANGES AND OTHER INSTRUCTIONS.
NOTE (2)
ON ALL SCREENS OBSERVE THE PROMPTS ON THE BOTTOM BAR FOR
INSTRUCTIONS.
CONTINUE PRESSING DOWN ARROW
TO PROGRAM UP TO 32 SENSOR
CIRCUITS.
PRESS
↓
CPC -SENSOR SETPOINTS- 10:40
No: 32 Status:OFF Name: Rack #1 Suc
Type:100lb Using Only of 000 000 000
CurrentValues: 012 of 012 000 000 000
On 0015 Dly 060s Off 0 008 Dly 030s
Alarms: High 055 Low 003 Dly 030m
Notices: High 050 Low 005 Dly 060m
↑=Prev Page ↓=Next Page 9=Alm 0=Main
SEE NOTE (1)

Fig. B-5

Sensor Control Diagram

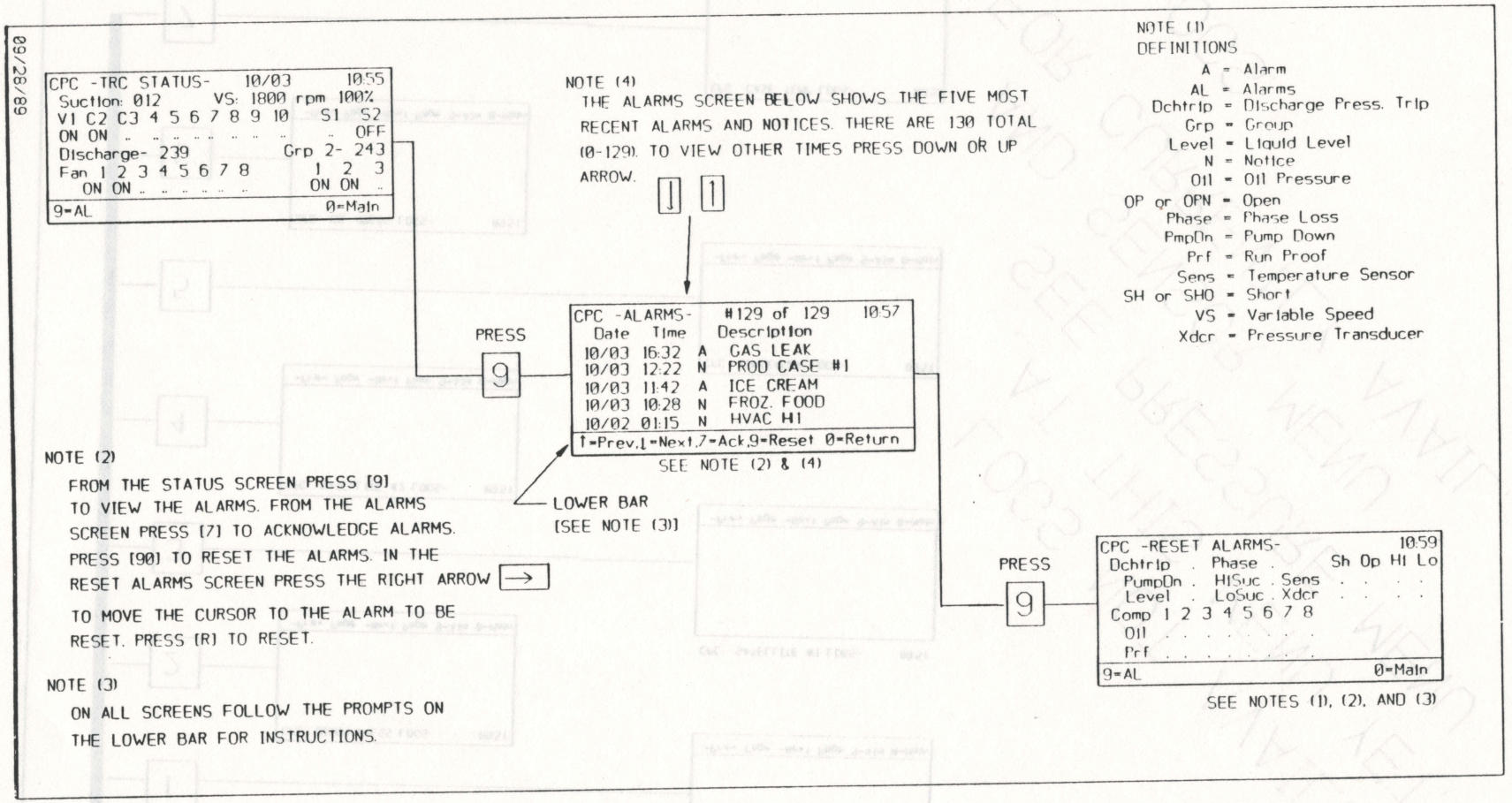
09/28/89
CPC -TRC STATUS- 10/03 10:55
Suction: 012 VS: 1800 rpm 100%
V1 C2 C3 4 5 6 7 8 9 10 S1 S2
ON ON .. .. OFF
Discharge- 239 Grp 2- 243
Fan 1 2 3 4 5 6 7 8 1 2 3
ON ON .. .. ON ON ..
9=AL 0=Main
NOTE (4)
THE ALARMS SCREEN BELOW SHOWS THE FIVE MOST RECENT ALARMS AND NOTICES. THERE ARE 130 TOTAL (0-129). TO VIEW OTHER TIMES PRESS DOWN OR UP ARROW.
1
NOTE (1)
DEFINITIONS
A = Alarm
AL = Alarms
Dchtrip = Discharge Press. Trip
Grp = Group
Level = Liquid Level
N = Notice
Oil = Oil Pressure
OP or OPN = Open
Phase = Phase Loss
PmpDn = Pump Down
Prf = Run Proof
Sens = Temperature Sensor
SH or SHO = Short
VS = Variable Speed
Xdcr = Pressure Transducer
PRESS
9
CPC -ALARMS- #129 of 129 10:57
Date Time Description
10/03 16:32 A GAS LEAK
10/03 12:22 N PROD CASE #1
10/03 11:42 A ICE CREAM
10/03 10:28 N FROZ. FOOD
10/02 01:15 N HVAC #1
↑=Prev,↓=Next,7=Ack,9=Reset 0=Return
SEE NOTE (2) & (4)
LOWER BAR
(SEE NOTE (3))
NOTE (2)
FROM THE STATUS SCREEN PRESS (9) TO VIEW THE ALARMS. FROM THE ALARMS SCREEN PRESS (7) TO ACKNOWLEDGE ALARMS. PRESS (90) TO RESET THE ALARMS. IN THE RESET ALARMS SCREEN PRESS THE RIGHT ARROW → TO MOVE THE CURSOR TO THE ALARM TO BE RESET. PRESS (R) TO RESET.
NOTE (3)
ON ALL SCREENS FOLLOW THE PROMPTS ON THE LOWER BAR FOR INSTRUCTIONS.
PRESS
9
CPC -RESET ALARMS- 10:59
Dchtrip . Phase . Sh Op Hi Lo
PumpDn . HiSuc . Sens . . . . .
Level . LoSuc . Xdcr . . . . .
Comp 1 2 3 4 5 6 7 8
Oil . . . . . .
Prf . . . . . .
9=AL 0=Main
SEE NOTES (1), (2), AND (3)

Fig. B-6

Main Status Diagram

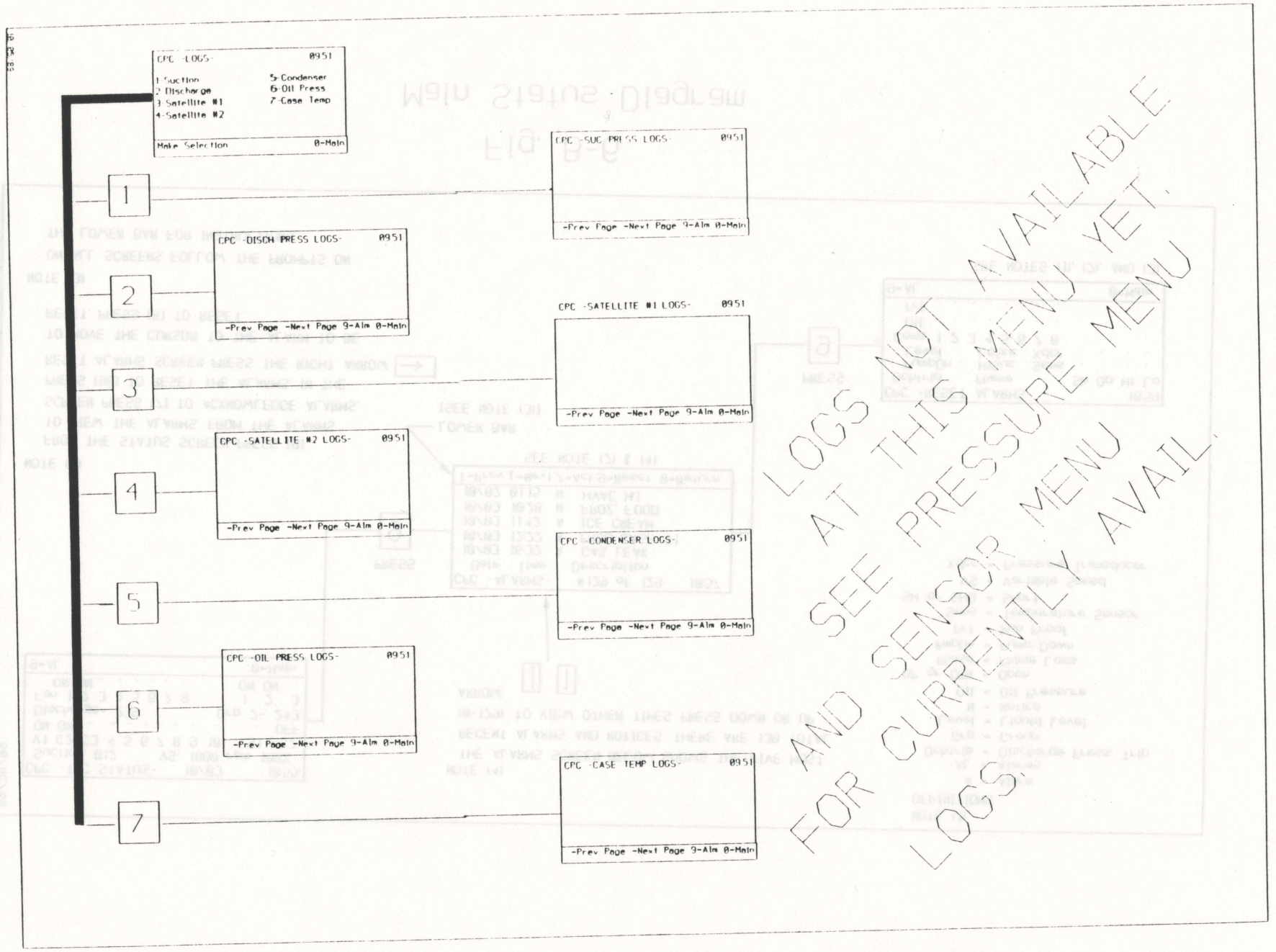

Fig. B-7
Logs Menu Diagram

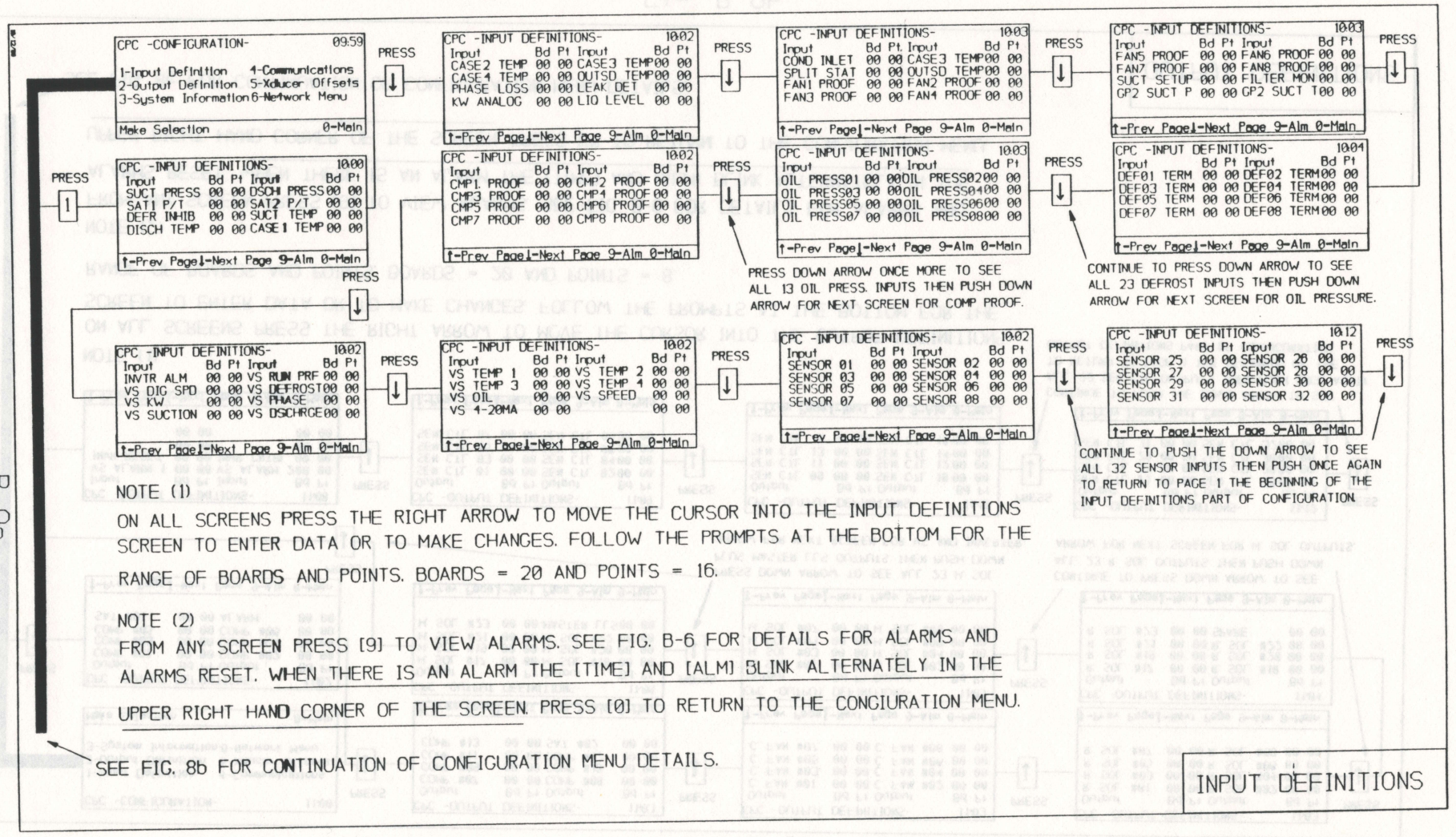
CPC -CONFIGURATION- 09:59
1-Input Definition 4-Communications
2-Output Definition 5-Xducer Offsets
3-System Information 6-Network Menu
Make Selection 0-Main
PRESS
CPC -INPUT DEFINITIONS- 10:00
Input Bd Pt Input Bd Pt
SUCT PRESS 00 00 DSCH PRESS 00 00
SAT1 P/T 00 00 SAT2 P/T 00 00
DEFR INHIB 00 00 SUCT TEMP 00 00
DISCH TEMP 00 00 CASE1 TEMP 00 00
↑-Prev Page↓-Next Page 9-Alm 0-Main
PRESS
CPC -INPUT DEFINITIONS- 10:02
Input Bd Pt Input Bd Pt
CASE2 TEMP 00 00 CASE3 TEMP 00 00
CASE4 TEMP 00 00 OUTSD TEMP 00 00
PHASE LOSS 00 00 LEAK DET 00 00
KW ANALOG 00 00 LIQ LEVEL 00 00
↑-Prev Page↓-Next Page 9-Alm 0-Main
PRESS
CPC -INPUT DEFINITIONS- 10:03
Input Bd Pt Input Bd Pt
COND INLET 00 00 CASE3 TEMP 00 00
SPLIT STAT 00 00 OUTSD TEMP 00 00
FAN1 PROOF 00 00 FAN2 PROOF 00 00
FAN3 PROOF 00 00 FAN4 PROOF 00 00
↑-Prev Page↓-Next Page 9-Alm 0-Main
PRESS
CPC -INPUT DEFINITIONS- 10:03
Input Bd Pt Input Bd Pt
FAN5 PROOF 00 00 FAN6 PROOF 00 00
FAN7 PROOF 00 00 FAN8 PROOF 00 00
SUCT SETUP 00 00 FILTER MON 00 00
GP2 SUCT P 00 00 GP2 SUCT T 00 00
↑-Prev Page↓-Next Page 9-Alm 0-Main
PRESS
CPC -INPUT DEFINITIONS- 10:02
Input Bd Pt Input Bd Pt
CMP1 PROOF 00 00 CMP2 PROOF 00 00
CMP3 PROOF 00 00 CMP4 PROOF 00 00
CMP5 PROOF 00 00 CMP6 PROOF 00 00
CMP7 PROOF 00 00 CMP8 PROOF 00 00
↑-Prev Page↓-Next Page 9-Alm 0-Main
PRESS
CPC -INPUT DEFINITIONS- 10:03
Input Bd Pt Input Bd Pt
OIL PRESS01 00 00 OIL PRESS02 00 00
OIL PRESS03 00 00 OIL PRESS04 00 00
OIL PRESS05 00 00 OIL PRESS06 00 00
OIL PRESS07 00 00 OIL PRESS08 00 00
↑-Prev Page↓-Next Page 9-Alm 0-Main
PRESS
CPC -INPUT DEFINITIONS- 10:04
Input Bd Pt Input Bd Pt
DEF01 TERM 00 00 DEF02 TERM 00 00
DEF03 TERM 00 00 DEF04 TERM 00 00
DEF05 TERM 00 00 DEF06 TERM 00 00
DEF07 TERM 00 00 DEF08 TERM 00 00
↑-Prev Page↓-Next Page 9-Alm 0-Main
PRESS
CPC -INPUT DEFINITIONS- 10:02
Input Bd Pt Input Bd Pt
INVTR ALM 00 00 VS RUN PRF 00 00
VS DIG SPD 00 00 VS DEFROST 00 00
VS KW 00 00 VS PHASE 00 00
VS SUCTION 00 00 VS DSCHRGE 00 00
↑-Prev Page↓-Next Page 9-Alm 0-Main
PRESS
CPC -INPUT DEFINITIONS- 10:02
Input Bd Pt Input Bd Pt
VS TEMP 1 00 00 VS TEMP 2 00 00
VS TEMP 3 00 00 VS TEMP 4 00 00
VS OIL 00 00 VS SPEED 00 00
VS 4-20MA 00 00 00 00
↑-Prev Page↓-Next Page 9-Alm 0-Main
PRESS
CPC -INPUT DEFINITIONS- 10:02
Input Bd Pt Input Bd Pt
SENSOR 01 00 00 SENSOR 02 00 00
SENSOR 03 00 00 SENSOR 04 00 00
SENSOR 05 00 00 SENSOR 06 00 00
SENSOR 07 00 00 SENSOR 08 00 00
↑-Prev Page↓-Next Page 9-Alm 0-Main
PRESS
CPC -INPUT DEFINITIONS- 10:12
Input Bd Pt Input Bd Pt
SENSOR 25 00 00 SENSOR 26 00 00
SENSOR 27 00 00 SENSOR 28 00 00
SENSOR 29 00 00 SENSOR 30 00 00
SENSOR 31 00 00 SENSOR 32 00 00
↑-Prev Page↓-Next Page 9-Alm 0-Main
PRESS
PRESS DOWN ARROW ONCE MORE TO SEE ALL 13 OIL PRESS. INPUTS THEN PUSH DOWN ARROW FOR NEXT SCREEN FOR COMP PROOF.
CONTINUE TO PRESS DOWN ARROW TO SEE ALL 23 DEFROST INPUTS THEN PUSH DOWN ARROW FOR NEXT SCREEN FOR OIL PRESSURE.
CONTINUE TO PUSH THE DOWN ARROW TO SEE ALL 32 SENSOR INPUTS THEN PUSH ONCE AGAIN TO RETURN TO PAGE 1 THE BEGINNING OF THE INPUT DEFINITIONS PART OF CONFIGURATION.
NOTE (1)
ON ALL SCREENS PRESS THE RIGHT ARROW TO MOVE THE CURSOR INTO THE INPUT DEFINITIONS SCREEN TO ENTER DATA OR TO MAKE CHANGES. FOLLOW THE PROMPTS AT THE BOTTOM FOR THE RANGE OF BOARDS AND POINTS. BOARDS = 20 AND POINTS = 16.
NOTE (2)
FROM ANY SCREEN PRESS [9] TO VIEW ALARMS. SEE FIG. B-6 FOR DETAILS FOR ALARMS AND ALARMS RESET. WHEN THERE IS AN ALARM THE [TIME] AND [ALM] BLINK ALTERNATELY IN THE UPPER RIGHT HAND CORNER OF THE SCREEN. PRESS [0] TO RETURN TO THE CONGIURATION MENU.
SEE FIG. 8b FOR CONTINUATION OF CONFIGURATION MENU DETAILS.
INPUT DEFINITIONS

Fig. B-8a
Configuration Diagram

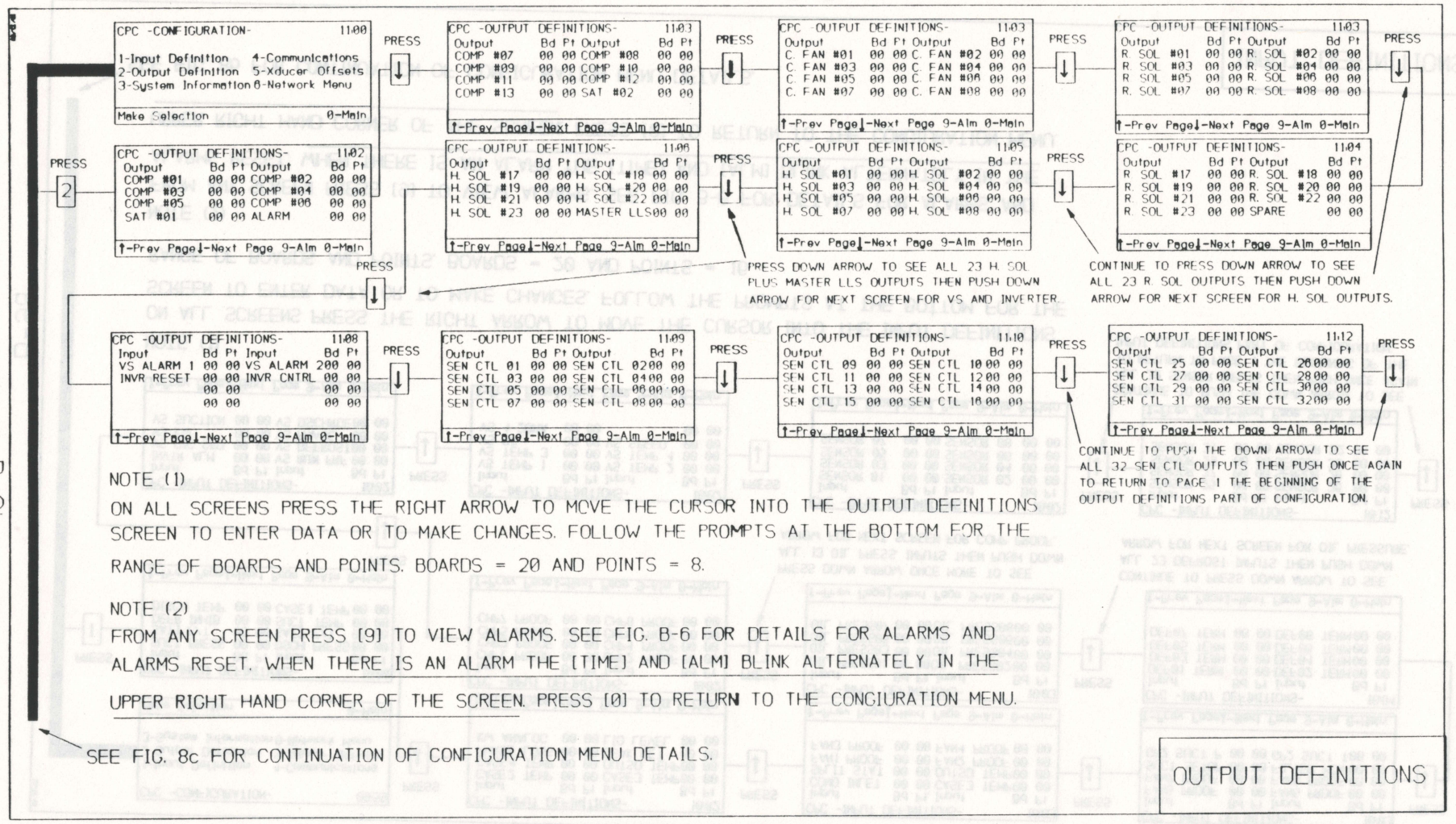
CPC -CONFIGURATION- 11:00
1-Input Definition 4-Communications
2-Output Definition 5-Xducer Offsets
3-System Information 6-Network Menu
Make Selection 0-Main
PRESS
2
CPC -OUTPUT DEFINITIONS- 11:02
Output Bd Pt Output Bd Pt
COMP #01 00 00 COMP #02 00 00
COMP #03 00 00 COMP #04 00 00
COMP #05 00 00 COMP #06 00 00
SAT #01 00 00 ALARM 00 00
↑-Prev Page↓-Next Page 9-Alm 0-Main
CPC -OUTPUT DEFINITIONS- 11:03
Output Bd Pt Output Bd Pt
COMP #07 00 00 COMP #08 00 00
COMP #09 00 00 COMP #10 00 00
COMP #11 00 00 COMP #12 00 00
COMP #13 00 00 SAT #02 00 00
↑-Prev Page↓-Next Page 9-Alm 0-Main
CPC -OUTPUT DEFINITIONS- 11:03
Output Bd Pt Output Bd Pt
C. FAN #01 00 00 C. FAN #02 00 00
C. FAN #03 00 00 C. FAN #04 00 00
C. FAN #05 00 00 C. FAN #06 00 00
C. FAN #07 00 00 C. FAN #08 00 00
↑-Prev Page↓-Next Page 9-Alm 0-Main
CPC -OUTPUT DEFINITIONS- 11:03
Output Bd Pt Output Bd Pt
R. SOL #01 00 00 R. SOL #02 00 00
R. SOL #03 00 00 R. SOL #04 00 00
R. SOL #05 00 00 R. SOL #06 00 00
R. SOL #07 00 00 R. SOL #08 00 00
↑-Prev Page↓-Next Page 9-Alm 0-Main
CPC -OUTPUT DEFINITIONS- 11:08
Input Bd Pt Input Bd Pt
VS ALARM 1 00 00 VS ALARM 2 00 00
INVR RESET 00 00 INVR CNTRL 00 00
00 00 00 00
00 00 00 00
↑-Prev Page↓-Next Page 9-Alm 0-Main
CPC -OUTPUT DEFINITIONS- 11:09
Output Bd Pt Output Bd Pt
SEN CTL 01 00 00 SEN CTL 02 00 00
SEN CTL 03 00 00 SEN CTL 04 00 00
SEN CTL 05 00 00 SEN CTL 06 00 00
SEN CTL 07 00 00 SEN CTL 08 00 00
↑-Prev Page↓-Next Page 9-Alm 0-Main
CPC -OUTPUT DEFINITIONS- 11:10
Output Bd Pt Output Bd Pt
SEN CTL 09 00 00 SEN CTL 10 00 00
SEN CTL 11 00 00 SEN CTL 12 00 00
SEN CTL 13 00 00 SEN CTL 14 00 00
SEN CTL 15 00 00 SEN CTL 16 00 00
↑-Prev Page↓-Next Page 9-Alm 0-Main
CPC -OUTPUT DEFINITIONS- 11:12
Output Bd Pt Output Bd Pt
SEN CTL 25 00 00 SEN CTL 26 00 00
SEN CTL 27 00 00 SEN CTL 28 00 00
SEN CTL 29 00 00 SEN CTL 30 00 00
SEN CTL 31 00 00 SEN CTL 32 00 00
↑-Prev Page↓-Next Page 9-Alm 0-Main
CPC -OUTPUT DEFINITIONS- 11:06
Output Bd Pt Output Bd Pt
H. SOL #17 00 00 H. SOL #18 00 00
H. SOL #19 00 00 H. SOL #20 00 00
H. SOL #21 00 00 H. SOL #22 00 00
H. SOL #23 00 00 MASTER LLS 00 00
↑-Prev Page↓-Next Page 9-Alm 0-Main
CPC -OUTPUT DEFINITIONS- 11:05
Output Bd Pt Output Bd Pt
H. SOL #01 00 00 H. SOL #02 00 00
H. SOL #03 00 00 H. SOL #04 00 00
H. SOL #05 00 00 H. SOL #06 00 00
H. SOL #07 00 00 H. SOL #08 00 00
↑-Prev Page↓-Next Page 9-Alm 0-Main
CPC -OUTPUT DEFINITIONS- 11:04
Output Bd Pt Output Bd Pt
R. SOL #17 00 00 R. SOL #18 00 00
R. SOL #19 00 00 R. SOL #20 00 00
R. SOL #21 00 00 R. SOL #22 00 00
R. SOL #23 00 00 SPARE 00 00
↑-Prev Page↓-Next Page 9-Alm 0-Main
PRESS
PRESS DOWN ARROW TO SEE ALL 23 H. SOL PLUS MASTER LLS OUTPUTS THEN PUSH DOWN ARROW FOR NEXT SCREEN FOR VS AND INVERTER
CONTINUE TO PRESS DOWN ARROW TO SEE ALL 23 R. SOL OUTPUTS THEN PUSH DOWN ARROW FOR NEXT SCREEN FOR H. SOL OUTPUTS.
CONTINUE TO PUSH THE DOWN ARROW TO SEE ALL 32 SEN CTL OUTPUTS THEN PUSH ONCE AGAIN TO RETURN TO PAGE 1 THE BEGINNING OF THE OUTPUT DEFINITIONS PART OF CONFIGURATION.
NOTE (1)
ON ALL SCREENS PRESS THE RIGHT ARROW TO MOVE THE CURSOR INTO THE OUTPUT DEFINITIONS SCREEN TO ENTER DATA OR TO MAKE CHANGES. FOLLOW THE PROMPTS AT THE BOTTOM FOR THE RANGE OF BOARDS AND POINTS. BOARDS = 20 AND POINTS = 8.
NOTE (2)
FROM ANY SCREEN PRESS [9] TO VIEW ALARMS. SEE FIG. B-6 FOR DETAILS FOR ALARMS AND ALARMS RESET. WHEN THERE IS AN ALARM THE [TIME] AND [ALM] BLINK ALTERNATELY IN THE UPPER RIGHT HAND CORNER OF THE SCREEN. PRESS [0] TO RETURN TO THE CONGIURATION MENU.
SEE FIG. 8c FOR CONTINUATION OF CONFIGURATION MENU DETAILS.
OUTPUT DEFINITIONS

Fig. B-8b
Configuration Diagram

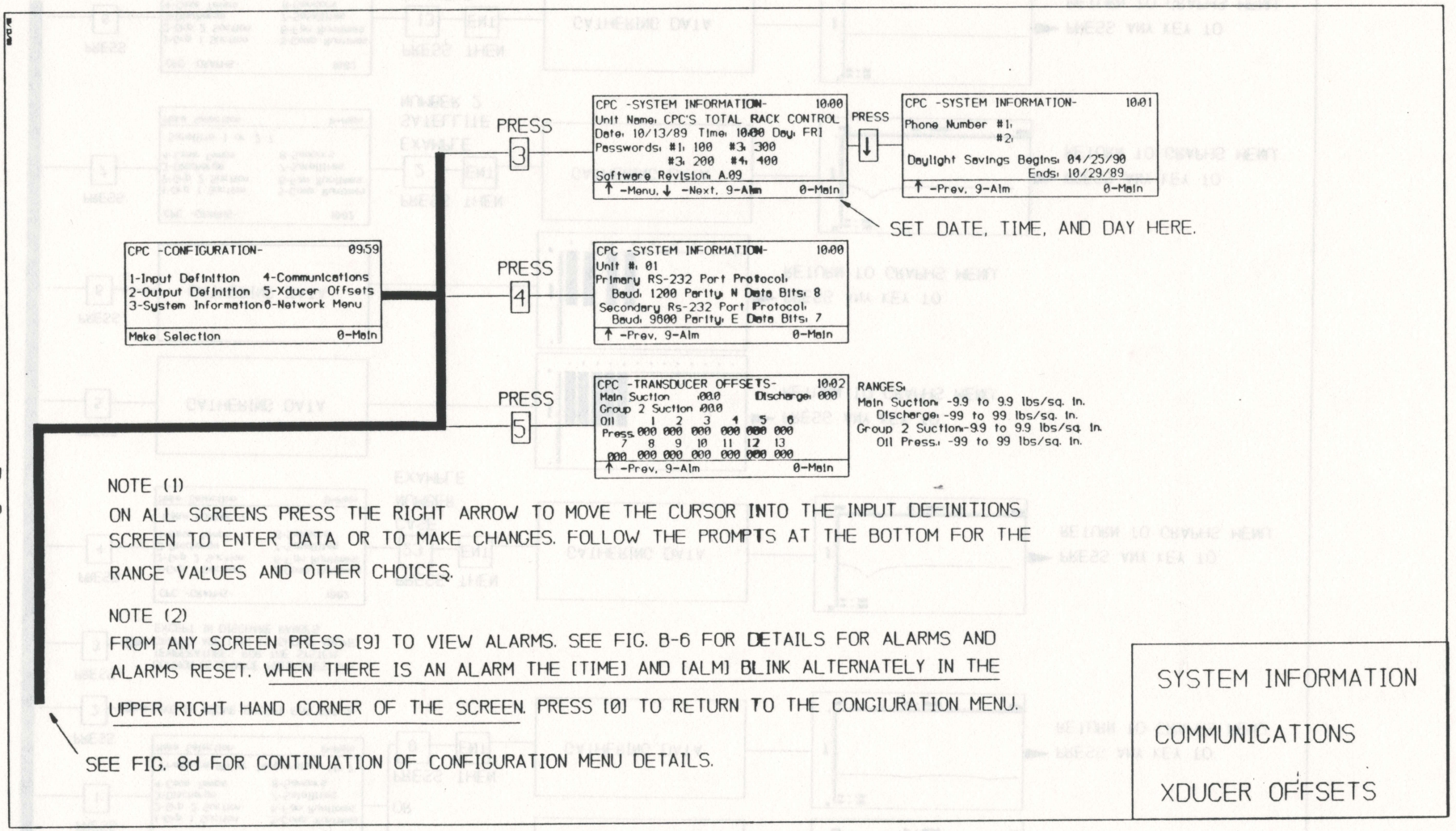
CPC -CONFIGURATION- 09:59
1-Input Definition 4-Communications
2-Output Definition 5-Xducer Offsets
3-System Information 6-Network Menu
Make Selection 0-Main
PRESS 3
CPC -SYSTEM INFORMATION- 10:00
Unit Name: CPC'S TOTAL RACK CONTROL
Date: 10/13/89 Time: 10:00 Day: FRI
Passwords: #1: 100 #3: 300
#3: 200 #4: 400
Software Revision: A.09
↑ -Menu, ↓ -Next, 9-Alm 0-Main
PRESS ↓
CPC -SYSTEM INFORMATION- 10:01
Phone Number #1:
#2:
Daylight Savings Begins: 04/25/90
Ends: 10/29/89
↑ -Prev, 9-Alm 0-Main
SET DATE, TIME, AND DAY HERE.
PRESS 4
CPC -SYSTEM INFORMATION- 10:00
Unit #: 01
Primary RS-232 Port Protocol:
Baud: 1200 Parity: N Data Bits: 8
Secondary Rs-232 Port Protocol:
Baud: 9600 Parity: E Data Bits: 7
↑ -Prev, 9-Alm 0-Main
PRESS 5
CPC -TRANSDUCER OFFSETS- 10:02
Main Suction .000 Discharge: 000
Group 2 Suction .000
Oil 1 2 3 4 5 6
Press 000 000 000 000 000 000
7 8 9 10 11 12 13
000 000 000 000 000 000 000
↑ -Prev, 9-Alm 0-Main
RANGES:
Main Suction: -9.9 to 9.9 lbs/sq. in.
Discharge: -99 to 99 lbs/sq. in.
Group 2 Suction: -9.9 to 9.9 lbs/sq. in.
Oil Press.: -99 to 99 lbs/sq. in.
NOTE (1)
ON ALL SCREENS PRESS THE RIGHT ARROW TO MOVE THE CURSOR INTO THE INPUT DEFINITIONS SCREEN TO ENTER DATA OR TO MAKE CHANGES. FOLLOW THE PROMPTS AT THE BOTTOM FOR THE RANGE VALUES AND OTHER CHOICES.
NOTE (2)
FROM ANY SCREEN PRESS [9] TO VIEW ALARMS. SEE FIG. B-6 FOR DETAILS FOR ALARMS AND ALARMS RESET. WHEN THERE IS AN ALARM THE [TIME] AND [ALM] BLINK ALTERNATELY IN THE UPPER RIGHT HAND CORNER OF THE SCREEN. PRESS [0] TO RETURN TO THE CONGIURATION MENU.
SEE FIG. 8d FOR CONTINUATION OF CONFIGURATION MENU DETAILS.
SYSTEM INFORMATION
COMMUNICATIONS
XDUCER OFFSETS

Fig. B-8c
Configuration Diagram

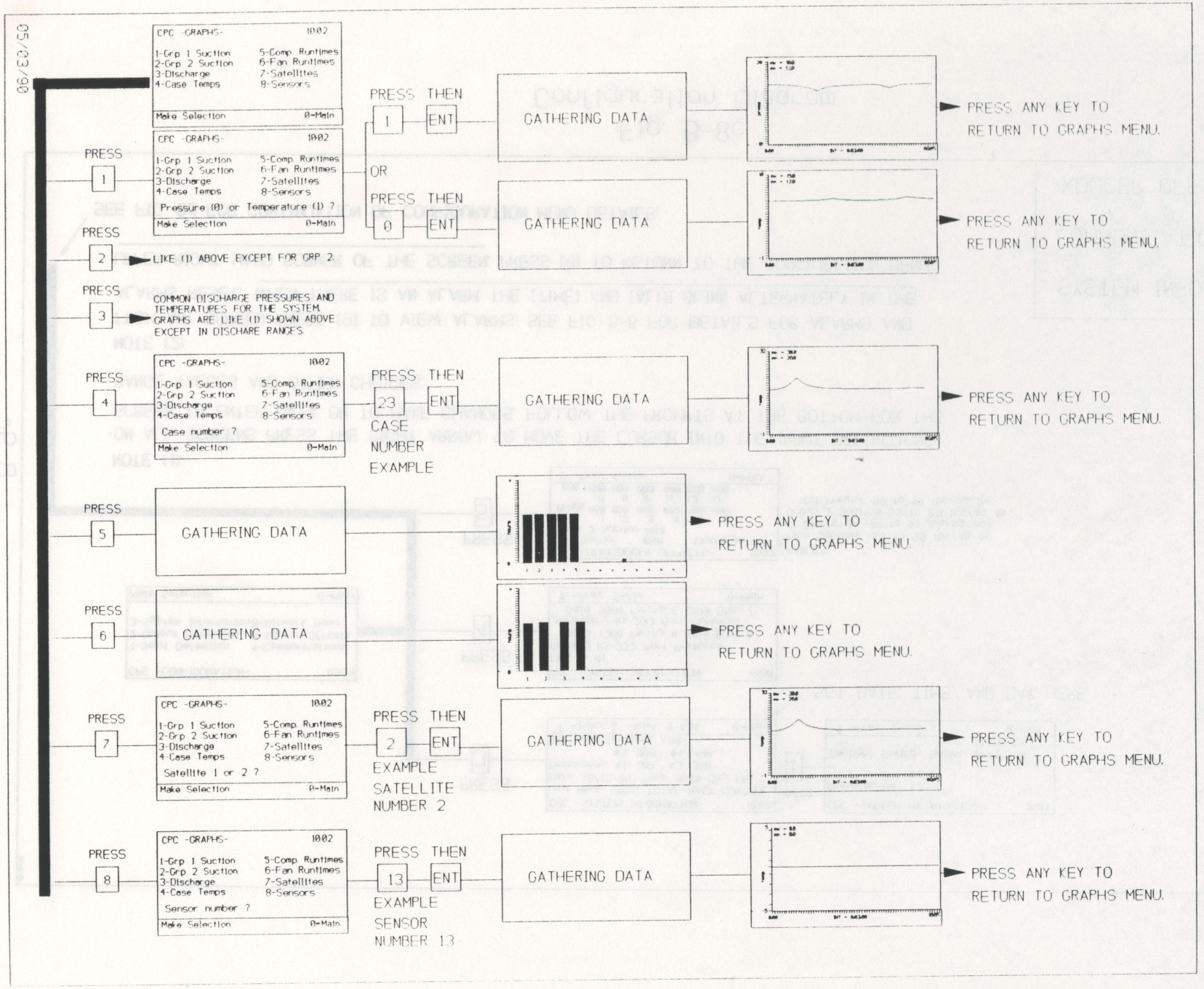

Fig. B-9
Graphs Diagram